GEOMAR REPORT

GEOMAR

Helmholtz-Zentrum für Ozeanforschung Kiel

RV POSEIDON Fahrtbericht / Cruise Report POS510

ANYDROS: Rifting and Hydrothermal Activity in the Cyclades Back-arc Basin

Catania (Italy) – Heraklion (Greece)
06.03.-29.03.2017

Berichte aus dem GEOMAR
Helmholtz-Zentrum für Ozeanforschung Kiel

Nr. 43 (N. Ser.)

October 2018

GEOMAR
Helmholtz-Zentrum für Ozeanforschung Kiel

RV POSEIDON Fahrtbericht / Cruise Report POS510

ANYDROS: Rifting and Hydrothermal Activity in the Cyclades Back-arc Basin

Catania (Italy) – Heraklion (Greece)
06.03.-29.03.2017

Berichte aus dem GEOMAR
Helmholtz-Zentrum für Ozeanforschung Kiel

Nr. 43 (N. Ser.)

October 2018

GEOMAR
Helmholtz-Zentrum für Ozeanforschung Kiel

Das GEOMAR Helmholtz-Zentrum für Ozeanforschung Kiel
ist Mitglied der Helmholtz-Gemeinschaft
Deutscher Forschungszentren e.V.

The GEOMAR Helmholtz Centre for Ocean Research Kiel
is a member of the Helmholtz Association of
German Research Centres

Herausgeber / Editor:
M.D. Hannington

GEOMAR Report
ISSN Nr.. 2193-8113, DOI 10.3289/GEOMAR_REP_NS_43_2018

Helmholtz-Zentrum für Ozeanforschung Kiel / Helmholtz Centre for Ocean Research Kiel
GEOMAR
Dienstgebäude Westufer / West Shore Building
Düsternbrooker Weg 20
D-24105 Kiel
Germany

Helmholtz-Zentrum für Ozeanforschung Kiel / Helmholtz Centre for Ocean Research Kiel
GEOMAR
Dienstgebäude Ostufer / East Shore Building
Wischhofstr. 1-3
D-24148 Kiel
Germany

Tel.: +49 431 600-0
Fax: +49 431 600-2805
www.geomar.de

Contents

1. Scientific Crew

Shipboard Participants:

Name	**Function Institute / Affiliation**
Hannington, Mark	Chief Scientist, GEOMAR[1]
Petersen, Sven	Senior Scientist, GEOMAR
Nomikou, Paraskevi	Observation, University of Athens[2]
Wind, Sandra	Gravity Core, University of Ottawa[3]
Heinath, Verena	Gravity Core, GEOMAR
Lange, Sabine	Gravity Core, GEOMAR
Rothenbeck, Marcel	AUV-Team, GEOMAR
Triebe, Lars	AUV-Team, GEOMAR
Wenzlaff, Emanuel	AUV-Team, GEOMAR

1=GEOMAR, Helmholtz Centre for Ocean Research Kiel; 2= National and Kapodistrian University of Athens, Faculty of Geology and Geoenvironment; 3= University of Ottawa, Department of Earth and Environmental Sciences

Chief Scientist and Contact:

Prof. Dr. Mark D. Hannington
GEOMAR Helmholtz Centre for Ocean Research Kiel
FB4, Magmatic and Hydrothermal Systems
Wischofstrasse 1-3
24148 KIEL, Germany
Phone: +49-431-600 1420
e-mail: mhannington@geomar.de

Participating Organizations:

POS-510 ANYDROS was a cooperation with the Dept. of Geology and Geoenvironment of the National and Kapodistrian University of Athens.

2. Research Programme and Scientific Objectives

2.1 Topic

Rifting and Hydrothermal Activity in the Cyclades Back-arc: Anydros Basin and Kolumbo Submarine Volcano, Southern Aegean Sea

2.2 Name

ANYDROS I

2.3 Scientific Discipline and Field of Work

Magmatic and Hydrothermal Systems: AUV Mapping, Gravity Coring, Heat Flow

2.4 Operations and Equipment

25 days of ship time (6 days for mobilization and demobilization, personnel transfers and transits; 19 days of on-site operations).

2.5 Study Area

The study area was within the 6 nm working limit of the islands of Santorini and Anydros (37°N to 36°N / 25°E to 26.5°E), from 100 meters to 500 meters water depth.

Embarkation port: Catania, Italy
Destination port: Heraklion, Greece (500 nm transit).
Infrastructure: AUV Abyss, 3 m Gravity Corer, Heat Flow

2.6 Short Introduction

Using an integrated approach of high-resolution bathymetry, AUV-based bathymetry and sidescan, heat flow and gravity coring, ANYDROS I documented the emergence of a high heat-flow rift basin in the continental margin arc of the southern Aegean Sea. The study area was chosen as a modern analog of the setting of many ancient base metal massive sulfide deposits, over half of which formed by processes related to rifting of continental basement and/or thickened arc crust. Metal-enriched crustal melts are produced in these settings where high heat flow related to rifting is retained by basin-fill sediments. Active rifting of arc crust and continental basement is occurring today in the working area of the Southern Cyclades region at the southern edge of the Aegean microplate. Two nascent back-arc rifts, the Anydros Basin and Santorini-Anafi Basin, are currently forming behind the Aegean volcanic arc adjacent to the Santorini volcanic complex. Young volcanoes in the Anydros rift (Kolumbo volcanic field), which are host to active hydrothermal venting and seafloor mineralization, provided a unique opportunity to study the relation between seafloor metallogenesis and the structural and thermal evolution of the arc rift.

Anydros I was part of a cluster of proposals for R/V POSEIDON in the Aegean and Santorini volcanic complex that brought together the expertise of GEOMAR's Research Division "Dynamics of the Ocean Floor" and the University of Athens. Two other independent but linked cruises of similar duration focused on the magmatic evolution of the arc-backarc system and the associated volcanic hazards. The GEOMAR-led cruises included 1) an investigation of the evolution of the NE-trending Christianna-Santorini-Kolumbo line (Geldmacher et al.), 2) the thermal and structural history of the Anydros Basin and its link to hydrothermal activity (this cruise), and 3) a time series and lateral facies analysis of Pleistocene to Holocene tephras (Freundt/Kutterolf et al.). All groups worked closely with researchers from the University of Athens (P. Nomikou), with additional input from the University of Hamburg (C. Hübscher).

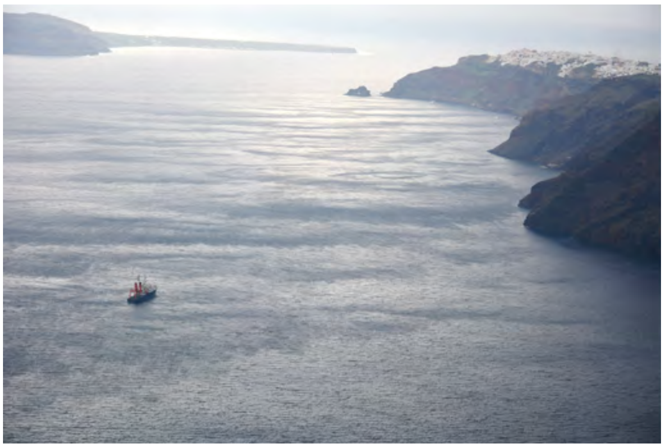


Figure 1A: Flags of Greece and Germany flying on RV POSEIDON. **B:** RV POSEIDON in the caldera of Santorini.

3. Background and Major Objectives

The goal of this project was to understand the initiation of arc rifting and associated back-arc hydrothermal activity. The focus was on the Anydros Rift system and Santorini-Kolumbo volcanic line, one of the few places in today's oceans where submarine rifting of a continental margin arc can be studied in its earliest stages. Using integrated geophysical and geological approaches we aimed to answer key questions related to the thermal and structural evolution of arc rifts.

The project focused on the thermal evolution of one of the near-arc rift basins, where recent volcanic and hydrothermal activity are a direct consequence of the arc rifting. We used heat flow and gravity coring, together with high-resolution imaging of local fault structures, seafloor volcanism, and dikes to address a fundamental question about the evolution of continental margin arcs: at what stage of rifting of the arc crust do magmatic and hydrothermal systems first emerge in the back-arc region and where do the associated ore deposits form. These objectives complemented ongoing research at National and Kapodistrian University of Athens to investigate volcanic and tectonic processes in the region.

The location of the Anydros Basin, immediately behind the active volcanic front of the arc, is similar to other arc rifts in both intraoceanic (e.g., NE Lau) and continental margin settings (e.g. Okinawa Trough). First mapped with modern multibeam in 2001 and 2006 (Nomikou et al., 2012a), it has been the subject of only a few studies, mainly focusing on reflection seismics (e.g., Fig. 2; Sakellariou et al., 2010; Hübscher et al., 2015; Nomikou et al., 2016). The basin is ~100 km long and 10-20 km wide, with depths of 200-400 m in the SW to almost 1000 m in the NE. Although it is incompletely mapped, the major rift-bounding faults are well located in seismic reflection profiles. There is a strong intersecting fault pattern in the basin, defined by the Kolumbo line and the bounding faults of the Anydros and Amorgos horsts (Bohnhoff et al., 2006; Sakellariou et al., 2010; Noumiko et al., 2012a; 2016). Dip angles of NE–SW trending major faults, like the Santorini–Amorgos Fault, indicate normal faulting to be the most important mechanism forming the present horst and graben environment. Hence, the area is likely in a state of NW–SE directed extensional stress forming the asymmetric graben structure of Anydros. Secondary fault clusters strike the same direction but show much steeper dip angles, possibly indicating strike-slip movement or resulting from deformational stress along the hinge zones of the normal faults. In the south, faulting associated with propagation of the rift into arc crust can be traced across the northern peninsula of Santorini. Focal mechanisms at this location confirm mainly normal faulting with a dextral strike-slip component, but the seafloor expression of these structures was unknown until mapped during POS510.

The Anydros basin has a distinctive half-graben geometry, as seen in seismic sections, with the largest listric normal faults at the margin of the Amorgos Horst. The unconformities suggest an episodic opening of the basin, with characteristic rotation of the hangingwall sediments. The faults have been imaged to a basement of mainly late Cretaceous metamorphic rocks that are well exposed on the adjacent islands, but upward continuations of the faults are not resolved (Fig. 2: Sakellariou et al., 2010; Hübscher et al., 2015). High sedimentation rates create the smooth basin floor, and so many parts of the rift structure are obscured. The uppermost units have been interpreted by Piper et al. (2007) as pyroclastic flow or mass-transport deposits and marine sediments correlated with the Akrotiri (650–550 ka BP) and the Thera (250 ka-recent) formations of Santorini. The 3.6 ka Minoan tephra deposits, which consist of thin ash and scoria beds, cover the area to more than 10 m thickness (Sigurdsson et al. 2006). Importantly, a number of subvolcanic intrusions are thought to be present in the basin fill (Sakellariou et al., 2010).

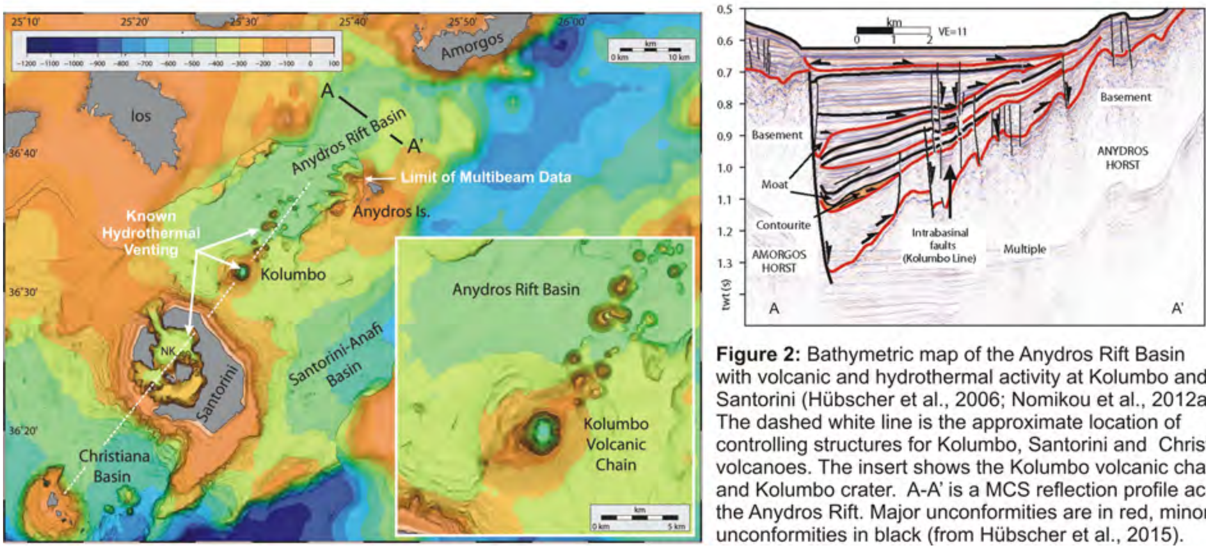


Figure 2: Bathymetric map of the Anydros Rift Basin with volcanic and hydrothermal activity at Kolumbo and Santorini (Hübscher et al., 2006; Nomikou et al., 2012a). The dashed white line is the approximate location of controlling structures for Kolumbo, Santorini and Christiana volcanoes. The insert shows the Kolumbo volcanic chain and Kolumbo crater. A-A' is a MCS reflection profile across the Anydros Rift. Major unconformities are in red, minor unconformities in black (from Hübscher et al., 2015).

The Santorini island group was also a focus of study. consists of three older islands (Thera, Thirasia and Aspronisi), which are arranged in a dissected ring around a flooded caldera, and the post-caldera islands Palea Kameni and Nea Kameni. Subaerial volcanism on Thera began at about 650 ka (Druitt et al., 1999). After the Minon eruption of 3.6 ka, volcanic activity was focused mainly in the intercaldera area building up Palea and Nea Kameni. About 7 km NE of Thera, the 350-m high submarine Kolumbo volcano and 19 other submarine cones form the Kolumbo Line within the Anydros Basin. The individual cones are 1-2 km in diameter and up to 1 km in height; Kolumbo, at the southern end of the chain, is the largest. It has a well-defined 1500-m wide crater with a crater rim as shallow as 17 m and the floor at 500 m. Although there are no high-resolution magnetic data that might reveal local intrusive activity, recent seismicity indicates movement of magma beneath Kolumbo (Noumikou et al., 2013) and volcanic dikes are evident throughout the area, including in new data collected during POS510. The sizes of the cones decrease towards the northeast, possibly indicating that the volcanic activity diminishes away from Kolumbo. Some of the other cones have well-defined craters, whereas others are dome-shaped. The earliest volcanism is not known, but Kolumbo became emergent in 1649 AD, with an eruption that triggered a caldera collapse and ejection of large quantities of rhyolitic pumice, creating highly stratified ash fall and flow deposits (Carey et al., 2011, 2013). Only the most recent volcanic products have been sampled, and a precise geochronological framework for the magmatism has not yet been established.

3.1 Hydrothermal Activity

The first visual confirmation of hydrothermal venting in the Kolumbo crater was in 2006 with the ROV Hercules. In 2010, active high-temperature venting (to 224°C) was documented at 36.525 E and 25.4833 N and 500 m depth, now referred to as the in the Kolumbo Hydrothermal Field (KHF). Spire-like chimneys up to 4 m in height and covering a small area of 5 x 5 m were observed in the western part of the KHF, named the Politeia Vent Complex, and on the northern crater slope (the inactive Poet's Candle). In the central part of the vent field there are also several low sulphide-sulphate mounds (e.g., Champagne Vent Complex). Previous mapping seems to indicate that the hydrothermal venting is dike-controlled (dikes in the wall of the caldera that are subparallel to the overall Kolumbo line of volcanoes: Nomikou et al., 2013). In addition to the focussed vents, low-temperature, diffuse venting occurs through pockmarked sediments throughout the NE part of the caldera, covering 25000 m^2 (Carey et al., 2013), where the floor of the crater is covered by a layer of orange bacterial mat. Temperature probe measurements in the area of bacterial mats consistently recorded temperatures 25-45°C above ambient just below the seafloor. Nomikou et al. (2012) also described hydrothermal activity at another cone in the Kolumbo line (VC7, Cone 7) at 36.5608 N and 25.525 E and a depth of 320 m. Visible streaks of manganese in pits and fractures in the volcaniclastic sediments were reported on VC7, but the extent of hydrothermal alteration was not established. These cones were targeted for heat flow and gravity coring during POS510.

Low-temperature hydrothermal activity is also well known in the Santorini caldera and on one of the smaller Christiana domes southwest of Santorini (Nomikou et al., 2013). Hydrothermal mineralization in the sediments of the Santorini caldera was first reported in 2006 from observations using the ROV Hercules. A large number of venting areas were discovered in the Northeast sub-basin, but only low temperatures were found (Sigurdsson et al., 2006a; Nomikou et al., 2012b). The NE vent field is 200-300 m in extent and consisted of numerous low, 1- to 4-m diameter, mounds (up to 1 m high) covered by a yellowish bacterial mat. The substrate is mainly Minoan volcaniclastic material, and temperatures in the sediment throughout the area are ~5 °C above ambient (Sigurdsson et al., 2006a). Similar low mounds and seeps are found along a ridge separating the West and South Basins and at shallower depths on the flanks of the Kamenev islands. However, no samples of the more extensive hydrothermal sediment had previously been collected.

3.2 Existing Data

All multibeam data presented in this report were provided by P. Nomikou of the Dept. of Geology and Geoenvironment of the National and Kapodistrian University of Athens. The maps are shown for reference only and are not to be copied or reproduced.

The first detailed bathymetric map of the area was produced in 2001 using the 20 kHz SB2120 swath system on R/V Aegean (Alexandra et al., 2003; Nomikou, 2003). A second survey in 2006 on R/Vs Aegean and Endeavor included single-channel seismic profiling, gravity and box coring, and ROV dives. Cruise NA-007 (R/V Nautilus) in 2010 explored the submarine volcanism and mineralization associated with the Kolumbo volcanoes using the ROVs Hercules and Argus (Kilian et al., 2013). The main focus of all high-resolution bathymetry was the KHF; less was known about the other parts of the rift. Although large areas are unmapped, more than 1600 km of reflection seismic data have been collected, including during R/V POSEIDON cruise POS-338, which imaged the structure and stratigraphy of the Kolumbo volcano and the major rift-bounding faults of the Anydros Basin (Hübscher et al., 2006, 2015, Institute of Geophysics, University of Hamburg). The main seismicity so far recorded in the Anydros Basin is located along the Santorini-Kolumbo submarine volcanic system, and especially below Kolumbo (Dimitriadis et al., 2009). However, there were no published heat flow data for the basin. Regional gravity cores from near Kolumbo were previously studied for trepha stratigraphy (Cantner et al., 2014; Fuller, 2015), but no data have been reported on hydrothermal influence in the sediments, including in the Kolumbo and Santorini calderas.

4. Selected References

Angelier, J, Lyberis, N, Le Pichon, X, et al., 1982. The tectonic development of the Hellenic Arc and the Sea of Crete: A Synthesis. Tectonophysics, 86, 159-196.

Alexandri, M, Papanikolaou, D, Nomikou, P, and Ballas, D, 2003. Santorini volcanic field – New insights based on swath bathymetry. IUGG 2003, Saporo, Japan.

Bornovas, J and Rondoyanni, T, 1984. Geological map of Greece, scale 1:500.000. Institute of Geology and Mineral Exploration, Athens.

Bohnhoff, M, Rische, M, Meier, T, et al., 2006. Microseismic activity in the Hellenic Volcanic Arc, Greece, with emphasis on the Santorini Amorgos Zone. Tectonophysics, 423, 17–33.

Cantner K, Carey S, Nomikou P, 2014. Integrated volcanologic and petrologic analysis of the 1650 AD eruption of Kolumbo submarine volcano, Greece. Jour. Volcanology Geotherm Res, 269, 28-43.

Carey, S, Bell K, Nomikou P, et al., 2011. Exploration of the Kolumbo Volcanic Rift Zone. The E/V Nautilus 2010 Field Season. Oceanography, 24 (1), 24–25.

Carey, S, Nomikou, P, Croff Bell, K, Ballard, D., 2013. Exploration of the Santorini volcanic group, southern Aegean Sea: Oceanography, 26 (1), 44–49.

Cathles, LM, 2011. What processes at mid-ocean ridges tell us about volcanogenic massive sulfide deposits. Mineralium Deposita, 46, 639–657.

Davis, EE, and Villinger, H, 1992. Tectonic and thermal structure of the Middle Valley sedimented rift, northern Juan de Fuca Ridge. Proceedings of ODP, Initial Reports. 139, 9–42.

Dimitriadis, I, Karagianni, E, Panagiotopoulos, et al., 2009. Seismicity and active tectonics at Kolumbo Reef, Aegean Sea. Tectonophysics 465, 136–149.

Druitt T.H., Edwards L., Mellors R.M., Pyle D.M., Sparks R.S.J., Lanphere M., Davis M., Bariero B. (1999) Santorini volcano. Geological Society Memoir 19, Geol. Soc. London.

Francalanci L, Vougioukalakis, GE, Perini, G, Manetti, P, 2005. A west-east traverse of the south Aegean volcanic arc in the light of volcanological, chemical and isotopic data. Fytikas & Vougioukalakis (Eds.) The South Aegean Active Volcanic Arc. Elsevier, 64-112.

Fuller S, 2015. Distribution of tephra from the 1650 AD submarine eruption of Kolumbo volcano, Greece. MSc thesis, University of Rhode Island, 73 p.

Glasby, GP, and Notsu, K, 2003. Submarine hydrothermal mineralization in the Okinawa trough, SW of Japan: An overview. Ore Geology Reviews, 23, 299–339.

Grevemeyer, I, Reston, T, Moeller, S, 2013. Micro-seismicity of the Mid-Atlantic Ridge at 7°S to 8°15'S and at the Logatchev Massif core complex. Geochem. Geophys. Geosyst., 14, 10.1002/ggge.20197.

Hannington, M, de Ronde, C, Petersen, S, 2005. Modern seafloor tectonics and submarine hydrothermal systems. 100th Anniversary Volume of Economic Geology, 111-142.

Hübscher, C, Hensch, M, Dahm, T, et al., 2006. Toward a risk assessment of central Aegean volcanos. Eos 87 (39), 401–407.

Hübscher, C, Ruhnau, M, Nomikou, P, 2015. Volcano-tectonic evolution of the polygenetic Kolumbo submarine volcano, Aegean Sea. Journal of Volcanology and Geothermal Research, 291, 101–111.

Jamieson, J, Hannington, M, Tivey, M, et al., 2016, Precipitation and growth of barite within hydrothermal vents. Geochimica et Cosmochimia Acta, 173, 64–85.

Kilias, S, Nomikou, P, Godelitsas, et al., 2011. Interdisciplinary mineralogic, microbiological and chemical studies of active Koloumbo shallow submarine arc-related hydrothermal vent field, Aegean Sea. Remote Sensing of Volcanoes 4–5 October 2011, London, p. 51.

Kilias SP, Nomikou, P, Papanikolaou, D, et al., 2013. New insights into hydrothermal vent processes in the shallow submarine arc-volcano, Kolumbo, Greece. Nature Scientific Reports, 3, 2421.

Martinez, F, Taylor, B, 2002. Mantle wedge control on back-arc crustal accretion. Nature, 416, 417-420.

Martinez, F, Taylor, B, Baker, E, et al., 2006. Opposing trends in crustal thickness and spreading rate along the back-arc Eastern Lau Spreading Center. Earth Planet. Sci. Lett., 245, 655-672.

McKenzie, DP, 1972, Active tectonics of the Mediterranean. Geophys. J. R. Astron. Soc. 30, 109-185.
Melidonis, NG, 2005. The geology of Anafi Island. Institute Geology & Mineral Exploration, Greece, p. 307.
Nomikou P, Carey S, Papanikolau D, et al., 2012a. Submarine Volcanoes of the Kolumbo volcanic zone NE of Santorini Caldera, Greece. Glob. Planet. Change, 90–91, 135-151.
Nomikou P, Croff Bell K, Bejelouk K, et al., 2012b. ROV Exploration of Santorini Caldera, Greece. Proc. 10th Hellenic Symposium on Oceanography & Fisheries, 7-11 May, 2012.
Nomikou, P, Papanikolaou, D, Alexandri, M, et al., 2013. Submarine volcanoes along the Aegean volcanic arc. Tectonophysics, 597, 123–146.
Papazachos, B, Dimitriadis S, Panagiotopoulos D, et al., 2005. Deep structure and active tectonics of the southern Aegean volcanic arc. Fytikas & Vougioukalakis (Eds.) The South Aegean Active Volcanic Arc. Elsevier, 4-64.
Petersen, S, Monecke, T, Westhues, A, Hannington, M, et. al., 2014. Drilling shallow water massive sulfides at the Palinuro Volcanic Complex, Aeolian Island Arc. Economic Geology, 109, 2129-2157.
Piper, D, Pe-Piper, G, Perissoratis, C, Anastasakis, G, 2007. Distribution and chronology of submarine volcanic rocks around Santorini and their relationship to faulting. Geol. Soc. London, 291, 99-111.
Sakellariou, D, Sigurdsson, H, Alexandri, M, et al., 2010. Active tectonics in the Hellenic Volcanic Arc: The Kolumbo submarine volcanic zone. Proceedings of the 12th International Congress, Patras.
Sigurdsson, H, Carey, S, Alexandri, M, et al., 2006a. Marine investigations of Greece's Santorini volcanic field. Eos, 87(34), 337–342.
Sigurdsson, H, Carey, S, Alexandri, M, et al., 2006b. High-temperature hydrothermal vent fields of Kolumbo submarine volcano: Site of the Kuroko-type mineralization. AGU Fall Meeting. OS34A-03.
Smart C, Roman C, Carey, S, 2013, Detection of diffuse seafloor venting using structured light imaging: G-Cubed, 14 (11), doi: 10.1002/ggge.20280
Yamazaki, T, 1988. Heat flow in the Sumisu Rift, Izu-Ogasawara. Bulletin of the Geological Survey of Japan, 39, 1, 63-70.

5. Station Locations

The working area of ANYDROS I was within (lat./long.) 37°N to 36°N / 25°E to 26°E. The water depths varied from <100 m to 500 m. The work was conducted in the Exclusive Economic Zone (EEZ) of Greece, entirely within the 6 nm limit. Applications for a permit to conduct scientific research were obtained from the Greek Ministry of Foreign Affairs. As part of this compliance we provided one berth for Greek research partners, with whom we have a good working relationship.

A complete list of stations is provided in **Appendix 1**.

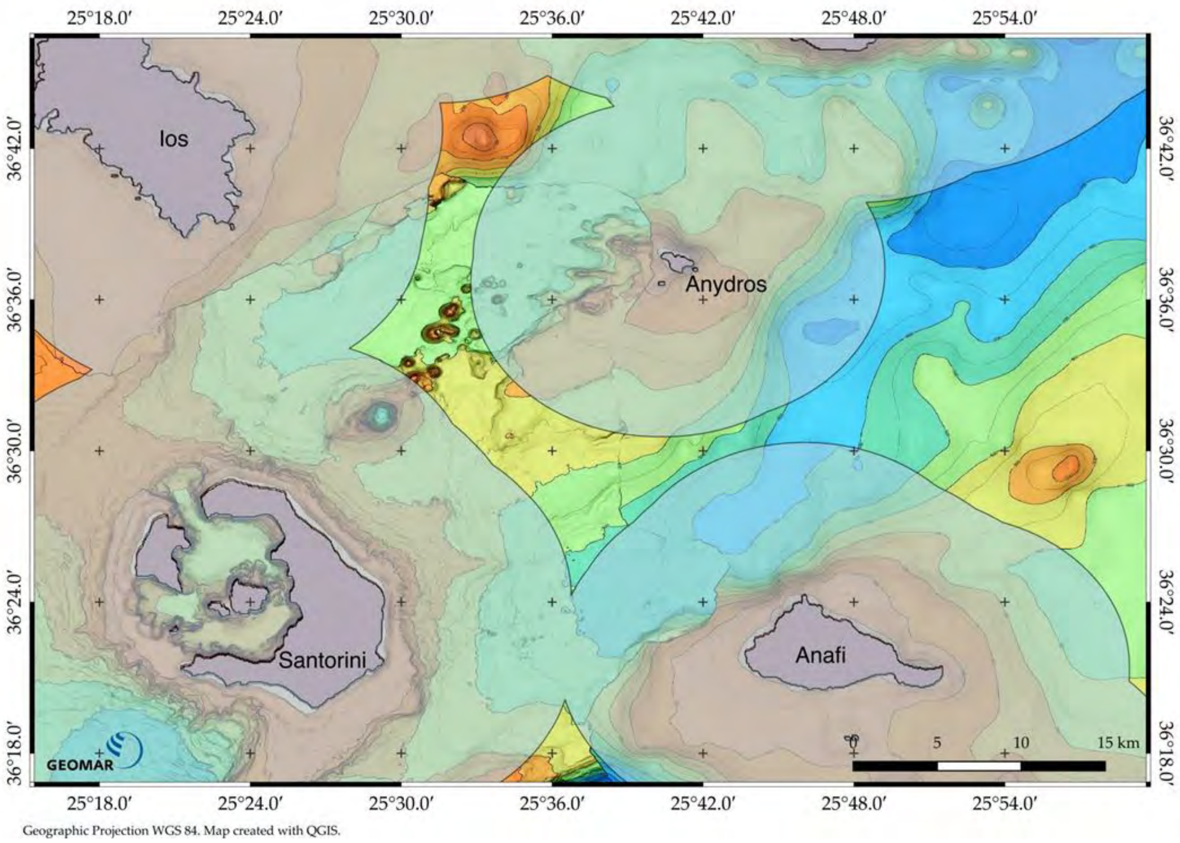


Figure 3: Working area and 6 nm limit.

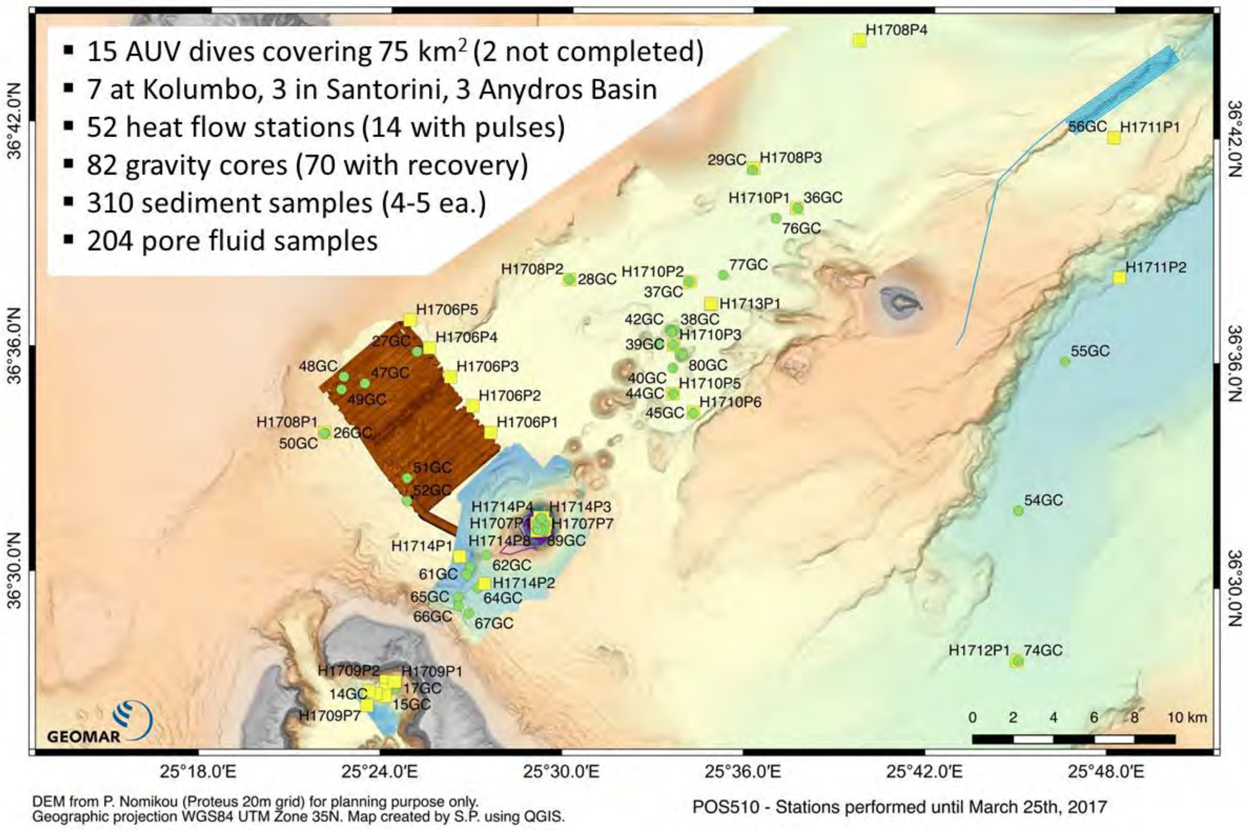


Figure 4: Summary map of stations as of March 25. The total number of stations and samples collected during the cruise are listed in the inse: 113 stations in 19 working days (164 stations including all casts).

6. Weather and Working Conditions

The scientific cruise POS-510 started in Catania and finished in Heraklion. The working area was situated in the southern Aegean Sea, between the islands Thira, Ios, Anafi and Anydros, inside the caldera of Thira, and near the Island of Christiana. Research activities consisted of AUV ABYSS operations, Heat Flow Probe surveys and Gravity Corer casts (3 m cores). The conditions were mainly pretty good; only 1 of the planned AUV dives had to be postponed in a gale force 8. The scheduled research programme was more than fulfilled, a total of 164 stations/casts, including 15 AUV dives, were successfully carried out. This would not have been possible without the patience and professionalism of the ship's crew and the AUV team.

7. Narrative and Schedule of Operations

Note: In the following narrative all times are reported in local time for the working area.

RV POSEIDON left the port of Catania, Italy, in the morning of Monday, March 6, and arrived on station in the Anydros Basin to commence operations at 8 am on Thursday, March 9.

Thursday, March 9: The first day of operations focused on background temperature profiles in the Anydros Basin west of the Kolumbo Line. A specially redesigned heat flow probe (Modell FIELAX GmbH, Bremerhaven) was used, consisting of a 3-m stainless steel lance and thermistor string (22 temperature sensors) with a temperature resolution of <0.01 °C). Five (5) heat flow stations, approximately 1 nm apart, were performed in the Anydros Basin NW of Kolumbo. Background temperatures were recorded across the rift zone at all locations, but penetration was limited due to clast-rich layers, except at one station on the western side of the basin nearest the Ios Fault.

The first deployment of the AUV Abyss was in the Anydros Basin west of Kolumbo, using the 120 kHz sidescan sonar configuration. The goal was to identify seafloor traces of the buried boundary faults of the rift. The vehicle was deployed at 4 pm and recovered the next morning (March 10) at 8 am after 15 hours of uneventful operations during the night. Preliminary inspection of the unprocessed sidescan data showed large-scale deposits of volcaniclastic material in the map area, related either to mass flows or pyroclastic deposits, and a number of seafloor traces of faults previously only seen in the seismic sections.

Friday, March 10: The first sampling inside the crater of Kolumbo Seamount was conducted using the 3-m gravity corer. The goal was to determine the extent of subseafloor hydrothermal activity beyond the small area of known venting in the NE of the caldera. Six (6) gravity cores were collected, encompassing an area of 300 x 300 m at the bottom of the caldera. High temperatures in the sampled sediments and hardened ("baked") layers of black sulfidic mud below 1 m indicate a laterally extensive hydrothermal alteration zone around the known vents. Cores outside the 100 m diameter area of venting were notably reduced, black and locally sulfidic. Two "hot cores" from the northern part of the caldera had temperatures at the bottom of the core between 96 ° and 87 °C (measured on the deck of the ship), corresponding to a boiling temperature at or below the seafloor of at least 265 °C (about 40 °C hotter than previously measured vent temperatures). The hottest cores stopped in hardened mud 2 m below the seafloor. These cores were still "hot to touch" hours after being recovered. Cores were visibly degassing when opened, with CO_2 bubbles forming in the water-saturated sediment; one core had a smell of sulfur. Coarse pumice clast-rich layers appear to have been saturated with boiling water, with several layers containing anhydrite. After opening and logging the cores, a total of 39 pore-water samples were extracted using Rhizon samplers. The pore fluids from the "hot cores" represent the highest-temperature fluids sampled at Kolumbo. 39 sediment samples also were taken from the cores.

During the night of Friday, March 10, a second AUV dive was carried out in the Anydros Basin to extend the sidescan survey further to the west of Kolumbo. The vehicle was recovered in the morning of March 11, and a second heat flow survey was started in the caldera of Kolumbo. Seven (7) stations were occupied, corresponding to the locations of the gravity cores collected on March 10.

Saturday, March 11: In anticipation of deteriorating weather at Kolumbo, operations were moved to planned targets in the caldera of Santorini. The objective here was to test the "connection" between the Kolumbo Line and the known hydrothermal activity in the Santorini Caldera. A first 200 kHz AUV multibeam survey was conducted during the night to map the extension of the Kolumbo Fault through the NE arm of Santorini Island, encompassing the known area of hydrothermal activity in the caldera.

Photo: Pore fluid sampling in hydrothermally altered ("baked") mud from Kolumbo crater. Pore fluids are extracted using Rhizon samplers with 4-cm long porous membrane filters (0.12-0.18 micron pore size). Pore fluids were extracted within 1-2 hours after opening of each core.

The following week of 12.03.17-19.03.17 was devoted to continued mapping and sampling along the Kolumbo Line and in the Anydros Basin. Unsettled weather meant that operations had to be moved several times during the week to gain shelter inside Santorini. Highlights were i) gravity coring and heat flow surveys of the northern flank of the Anydros Basin, ii) the completion of the sidescan survey of the Anydros Basin west of Kolumbo, iii) completion of the map and heat flow (plus gravity coring) survey of the low-temperature vents inside Santorini along the extension of the Kolumbo Fault, and iv) the first AUV dives at Kolumbo. The resulting map of the Kolumbo-Santorini corridor is one of the largest contiguous mapping projects of a volcanic complex ever conducted by Abyss (approaching 50 km^2).

Sunday, March 12: The AUV Abyss was recovered from an overnight dive in the NE part of the Santorini caldera at the intersection with the Kolumbo Fault. During the day, gravity coring was conducted in the area of low-temperature venting near the fault. Nine (9) gravity cores were taken in an area of 500 m x 500 m at 200 to 300 m depth. All cores contained Fe-oxide crusts, which attained a thickness of at least 3 m in several locations, and 3 cores had bottom temperatures of 19-21 °C (3-5 °C above ambient). The survey confirmed the areal extent of the low-temperature upflow in this part of the caldera and also showed the considerable thickness of the Fe-oxide deposits. In the late afternoon of Sunday, March 12, wind inside the caldera increased to force 8, preventing the safe launch of the AUV for its overnight dive. Operations were suspended until the morning of Monday, March 13.

Monday, March 13: Conditions outside Santorini improved and the regional survey of the Anydros Basin resumed. Four (4) heat flow stations, approximately 10-15 km apart, were occupied on the west side of the basin from 36 34’ N to 36 45’ N. The objective was to establish background heat flow in the oldest part of the rift adjacent to the basin-bounding Ios Fault Zone, where basin fill is at least 500 m thick. However, insufficient penetration of the probe prevented triggering of a heat pulse. All bottom thermistors recorded ambient temperatures in the mud of 15-16° C. In the evening of March 13, a fourth AUV dive was conducted in the western part of the rift, completing the sidescan survey of the Anydros basin. The data show at least one major fault trace in the basin sediments, ~1 km long, marked by a series of collapse pits, each 30-50 m in diameter. The orientation, which is oblique to the basin, probably reflects the regional dextral transtension on the basin-bounding faults. This appears to be a secondary fracture pattern that is now developing in the post-Kolumbo volcaniclastic sediments, subparallel to dikes that intrude the Kolumbo Line. A distinct “pinnacle” emerging from the sediment in the center of the rift may be an extension of one of these dikes.

Tuesday, March 14: A series of gravity cores were attempted along the Ios Fault. Only sediment in the core catcher was retrieved, consisting mainly of clay-rich mud. In the evening of March 14, the first deployment of the AUV was made at Kolumbo Seamount on the eastern flank and including the dike-like feature extending from the summit area in the southwest. The volcano has a youthful appearance with pyroclastic deposits covering the eastern flank; however, the dike-like feature outside the caldera has a very smooth surface compared to the volcano, most likely due to a blanket of ash from a very recent eruption (possibly the 1650 AD eruption recorded at Kolumbo).

Wednesday, March 15: After recovery of the AUV in the morning, operations were moved again into Santorini Caldera to avoid deteriorating weather at Kolumbo. During the day, a complete heat flow survey was conducted in the area of low-temperature venting along the extension of the Kolumbo Fault. Eight (8) penetrations of the heat flow probe were made with 5 successful heat flow measurements. The softest sediments are mainly amorphous Fe-oxides with finely laminated crusts, closest to the vents. Temperatures in the lower thermistors corresponded closely to those measured in the earlier gravity cores (19-21 °C). The maximum calculated heat flow was 1496 mW/m^2 in the area of the thickest Fe-oxide deposits. Outside this area, within a few hundred meters, heat flow decreases to between 500 and 700 mW/m^2 but is still very high compared to background values.

Thursday, March 16: With improved weather outside Santorini, we resumed heat probe deployments in the Anydros Basin along the northernmost volcanic cones of the Kolumbo Line. Unlike the area surrounding Kolumbo, where pumice-rich sediment prevented penetration of the heat probe, the sediments in the northern part of the Kolumbo Line and adjacent to the Anydros Fault were clay-rich and very stiff. This also prevented enough penetration to trigger a heat pulse and no heat flow measurements were made. Bottom thermistors recorded background temperatures of 15-16 °C. The first AUV dive inside the steep-walled Kolumbo crater was launched in the evening but terminated 2 hours early following a collision. No damage to the AUV resulted, and normal AUV operations were continued the following day.

Friday, March 17: Heat flow stations in the northern part of the Kolumbo Line and adjacent to the Anydros Fault were revisited with the 3-m gravity corer. Ten cores penetrated variably reduced clay-rich mud. In one core at the summit of one of the small volcanic cones, fractures in the mud were lined by Mn-oxide, but no other signs of hydrothermal activity were observed. A number of ash layers were found in several of the cores, including one layer with fresh mafic clasts (including unaltered olivine). In the evening the AUV was deployed for its third dive at Kolumbo.

Saturday, March 18: Following recovery of the AUV, we targeted several features observed in the sidescan survey in the west of the Anydros Basin opposite Santorini and Kolumbo. Cores were attempted along the fault trace observed in the sidescan, in dark patches adjacent to the fault, and at the location of several pinnacles in the middle of the basin. Traces of Fe-oxides were found near the pinnacles, but basalt fragments in the sediment confirmed that these structures are likely part of a protruding dike. Dive 8 of the AUV was launched in the evening, focussing on the saddle between Kolumbo and Santorini. Preliminary data from the AUV dives suggest that the Kolumbo Fault is occupied by a complex of dikes, probably similar to those observed in the wall of the Santorini Caldera where it is cut by the Kolumbo Fault.

The following week of 19.03.17-26.03.17 was devoted to completion of the regional surveys of the Anydros-Anafi-Amorgos basins. Greatly improved weather meant that all objectives were met in less than the anticipated time. Highlights were i) completion of the multibeam AUV survey of the Kolumbo volcano, the Kolumbo-Santorini Line, and the more distant surroundings of Kolumbo; ii) a gravity coring and heat flow survey of the Anafi and Amorgos basins and adjacent to the large Santorini-Amorgos Fault; iii) location of positive heat flow anomalies at two stations along the northern cones of the Kolumbo Line and recovery of sulfidic mud in cores from one of the cones; iv) completion of the gravity coring and heat flow survey of the entire area of the Kolumbo crater floor; v) expanded high-resolution multibeam map of the north basin of the Santorni caldera; vi) first sampling of Fe-oxide sediment in the western part of the Santorini caldera along the extension of the Kolumbo Line and on the Kameni Line separating the north and south basins.

Sunday, March 19: After recovering the AUV from its 8th dive and a 16 nm transit, operations started in the Amorgos Basin, which is older (wider) and deeper than the Anydros Basin. Two gravity cores were attempted adjacent to the Santorini-Amorgos Fault at 700 m depth and one adjacent to the Anydros Fault at 300-400 m depth. There was no recovery in the deep cores (only brown and grey mud in the core catcher). Adjacent to the Amorgos Fault, several meters of grey mud were recovered, bottoming in a 5 cm ash layer with notable fluid escape structures in fractures in the overlying mud. These are most likely related to seismic activity of the Amorgos Fault. Sediments in the Amorgos Basin were somewhat colder because of the greater depth, but heat flow measurements in both basins returned mainly negative values owing to the warmth of the bottom water.

Monday, March 20: Operations on the Kolumbo-Santorini Line resumed with gravity coring between Kolumbo and Santorini, targeting depressions above and below the fault. Grey, very fine-grained mud and clay with white pumice clasts was recovered in all of the cores. This very uniform grey mud is most likely ash that rained out of the water column following the latest eruptions of Kolumbo. Large, white pumice clasts, most likely from the 1650 eruption, were found embedded in the grey mud in several cores. A final two cores in Kolumbo near the Champagne vent field recovered 1 m of black sulfidic mud with pumice fragments at the top of the core that were coated with yellow sulfur. In the evening, the AUV was launched to continue the map of Kolumbo.

Tuesday, March 21: After recovering the AUV in the morning, regional heat flow and gravity coring resumed in the Anafi Basin. Sediments in this basin are mainly oxidized brown clay and bioturbated mud, more typical of what would be expected from erosion of the Alpine basement rocks on Anafi and Anydros, with relatively little volcaniclastic component. Only a few ash and pumice layers were recovered in the cores. In the evening, the AUV was launched near Anydros Island to map a portion of the Anydros Fault.

Wednesday, March 22: Following recovery of the AUV, a recording error was found, and the fully navigated map of the Anydros Fault Zone was lost. With only 4 dive days remaining, we chose not to repeat the dive. During the daytime the final heat flow and gravity coring stations were occupied along the line of small cones north of Kolumbo. Gravity cores targeting the northernmost cones recovered only brown clay and light grey mud in the core catcher (typical of the Anydros Basin). One gravity core on volcano 17 recovered 50 cm of dark grey sulfidic mud, similar to that in the Kolumbo crater. Two heat flow stations in this area, which penetrated up to several meters of sediment, recorded positive heat flow of 60 mW/m^2 (well above background values). This was the only positive heat flow in the Anydros Basin outside the Kolumbo crater. In the evening the AUV was launched to map the final northern portion of the volcano.

Thursday, March 23: After recovery of the AUV, the heat flow survey inside Kolumbo was expanded to include the entire crater floor. A maximum of 332 mW/m^2 was measured, confirming earlier measurements closer to the vent field (1600 mW/m^2 with a maximum bottom temperature of 20°C). Heat flow elsewhere in the crater, up to 400 m from the vents, was 34-58 mW/m^2, still significantly higher than background values outside the volcano. Two heat flow stations adjacent to the Kolumbo Line recorded only background values. In the evening the AUV was launched for the first dive to map the inside of the Kolumbo crater. Unfortunately the 400kHz data were not recorded.

Friday, March 24: After recovery of the AUV, the gravity coring inside Kolumbo was extended beyond the area of known venting. Cores up to 2 m long recovered very fine black sand and mud consisting of fine ash with traces of amorphous Fe-sulfide. This sediment was cored up to 300 m from the known vents, suggesting that the entire caldera is floored by reduced, sulfidic mud, well beyond the known vents. In the evening, the AUV was launched to repeat the last dive in the Kolumbo crater. The 200 kHz data were successfully recorded and the entire 7-dive map of the Kolumbo complex was finished, completing operations in the Anydros Basin.

Saturday, March 25: In the morning, we re-entered Santorini to map the remainder of the north basin and extension of the Santorini-Kolumbo Line inside the caldera. Gravity coring stations opposite a prominent mafic dike on the southernmost peninsula of Thirassia recovered Fe-oxide-rich sediment, and a temperatures of 20 °C was recorded in reduced sediments in the core catcher. Similar reduced sediments were recovered along the offshore extension of the "Kameni Line", between the north and south basin. Charcoal fragments were found in several of the cores, and a temperature of 25 °C was measured in the core catcher from one of the station, confirming that both structures are hydrothermally active along their entire lengths. In the evening the AUV was launched to extend the map of the north basin. This work completed one of the most aggressive mapping missions on record for the AUV Abyss, logging more than 196 hours of survey time and covering 1154 line-km of high-resolution multibeam and sidescan.

Sunday, March 26: Following recovery of the AUV, heat flow measurements were performed at the locations of the gravity coring in the western part of the north basin.

Monday, March 27: The final day of operations included 6 additional gravity cores in the western part of the Santorini caldera and 3 gravity cores on the summit of the small Christiana volcanic domes southwest of Santorini. The cores recovered less than 1 m of beige-coloured clay with darker grey mud at the bottom; no evidence of hydrothermal activity was observed in the cores. Having completed all planned sampling, operations were terminated in the afternoon for the transit to Heraklion.

Photo: AUV Abyss preparing for a dive in the caldera of Santorini Volcano.

8. Operations and Preliminary Results

8.1 AUV ABYSS (M. Rothenbeck, L. Triebe, E. Wenzlaff)

The Autonomous Underwater Vehicle (AUV) Abyss (built by HYDROID Inc.) from GEOMAR can be operated in water depths up to 6000 m. The system comprises the AUV itself, a control and workshop container, and a mobile Launch and Recovery System (LARS) with a deployment frame that was installed at the afterdeck of R/V POSEIDON. The self-contained LARS was developed by WHOI to support ship-based operations so that no Zodiac or crane is required for launch and recovery. The LARS is mounted on steel plates, which are screwed to the deck of the ship. The LARS is configured in a way that the AUV can be deployed over the stern or port/starboard side of the German medium and ocean-going research vessels. The AUV Abyss can be launched and recovered at weather conditions with a swell up to 2.5 m and wind speeds of up to 6 Beaufort. For the recovery the nose float pops off when triggered through an acoustic command. The float and the ca. 17 m recovery line drift away from the vehicle so that a grapnel hook can snag the line. The line is then connected to the LARS winch, and the vehicle is pulled up. Finally, the AUV is brought up on deck and secured in the LARS. The AUV missions were planned based on ships bathymetry.

Photo: The afterdeck of the R/V POSEIDON with the installed AUV-System (Photo: L. Triebe).

Photo: Transfer of the AUV Abyss from the container rails to the LARS rails using the ship's crane (Photo: P. Nomikou).

Mission summaries:

Normally the AUV Abyss uses a LBL (Long Baseline) system to support its navigation. But because of the low depth of the area and the close coastlines, it is possible to dive without transponders. On each dive the AUV started a point, were the DVL (Doppler Velocity Lock) can ping the bottom. (Altitude lower than 180m).

During cruise POS510, 15 missions were flown by the Autonomous Underwater Vehicle AUV Abyss (*Table **1***). The missions were done using exclusively the multibeam-configuration. The primary sensor was the Kongsberg RESON Seabat 7125 (multibeam echosounder), which is a combined system for 200 and 400 kHz. The frequency of 200 kHz was used in 11 dives and the frequency of 400kHz in one. The other sensor was the Edgtech sidescan-sonar 2200-M, which used the same configuration, like the multibeam (same payload). The AUV did three sidescan dives. The combination of a magnetometer (Applied Physics System APS 1540 Digital 3-Axis Miniature Fluxgate Magnetometer; S/N 685) and a Self Potential sensor (Silvion CCS1-Port Electrodes) is integrated inside the vehicle. The data of these sensors were logged on a combined data logger (Magson GmbH). The turbidity sensor (WetLabs ECO FLNTU Fluorometer and Turbidity sensor; S/N FLNTURTD-939), the REDOX potential sensor (by Ko-ichi Nakamura) and the CTD (Seabird SBE49 FastCAT; S/N 4948793-0168) ran simultaneously and served as secondary sensors. All data have a time stamp and/or are related to a position of the vehicle. Please consider that those positions are the original and not adjusted positions. More detailed information about the used sensors can be found in **Table 1**.

Table 1: AUV Mission Statistics for cruise POS510

Station	***Area***	***Dive***	***Date***	***Survey time***	***Mission time***	***Distance travelled***	***Sensors (Comments)***
2/AUV	Anydros Basin	257	09.03.17	14,02 h	15,25 h	84,66 km	SSS 120 kHz / Magn / SP
10/AUV	Anydros Basin	258	10.03.17	12,10 h	14,13 h	78,37 km	SSS 120 kHz / Magn / SP
12/AUV	Santorini	259	11.03.17	12,32 h	12,95 h	71,79 km	MB 200 kHz / Magn / SP / REDOX
25/AUV	Anydros Basin	260	13.03.17	13,25 h	15,85 h	87,39 km	SSS 120 kHz / Magn / SP / REDOX
30/AUV	Kolumbo	261	14.03.17	12,25 h	12,90 h	71,66 km	MB 200 kHz / Magn / SP / REDOX
35/AUV	Kolumbo	262	16.03.17	11,05 h	11,17 h	66,03 km	MB 200 kHz / Magn / SP / REDOX
46/AUV	Kolumbo	263	17.03.17	12,87 h	13,55 h	75,19 km	MB 200 kHz / Magn / SP / REDOX
53/AUV	Kolumbo	264	18.03.17	13,47 h	13,87 h	76,96 km	MB 200 kHz / Magn / SP / REDOX
71/AUV	Kolumbo	265	20.03.17	13,67 h	13,82 h	76,76 km	MB 200 kHz / Magn / SP / REDOX
75/AUV	Amorgos Fault	266	21.03.17	13,93 h	14,18 h	78,51 km	MB 200 kHz / Magn / SP / REDOX
82/AUV	Kolumbo	267	22.03.17	13,82 h	14,03 h	78,28 km	MB 200 kHz / Magn / SP / REDOX
86/AUV	Kolumbo	268	23.03.17	12,07 h	13,13 h	73,03 km	MB 400 kHz / Magn / SP / REDOX
94/AUV	Kolumbo	269	24.03.17	13,37 h	13,88 h	77,06 km	MB 200 kHz / Magn / SP / REDOX
103/AUV	Santorini	270	25.03.17	14,97 h	15,10 h	83,87 km	MB 200 kHz / Magn / SP / REDOX
105/AUV	Santorini	271	26.03.17	13,27 h	13,45 h	74,71 km	MB 200 kHz / Magn / SP / REDOX
			Total:	**196,43 h**	**207,26 h**	**1154,27 km**	

(Survey time = time spent mapping on the seafloor; Mission time = time including descent, survey and ascent phase; Distance travelled = total distance during mission; SSS = Sidescan-Sonar ; MB = Multibeam Echo Sounder; Magn. = Magnetometer; SP = Self Potential Sensor)

AUV Abyss Sensor Description is given in **Appendix 2**.

AUV Abyss Dive Protocols are in **Appendix 3**.

AUV sidescan and high-resolution magnetics:

Three long-range AUV sidescan surveys will be conducted in the Anydros Basin to better establish the seafloor expression of the rift-bounding faults and volcanic cones. In sidescan mode, the AUV Abyss operates at 120 kHz at an altitude of 60 m with a range to each side of 600 m; 40 km^2 can be mapped per deployment, allowing adequate coverage for the characterization of faulting fabric, volcanic geomorphology, and sediment cover. Magnetic data are collected from dedicated on-board instruments and help to identify hydrothermal alteration and/or mineralization as well as buried intrusive bodies. The specific targets will be the rift-bouding faults (Dives 1 and 2), portions of the Kolumbo line (Dive 2 and 3), and dike-like features on the flank of the Anydros horst (Dive 3). Two near-bottom high-resolution multibeam surveys (10 km^2 each) will also be carried out in the areas of known hydrothermal activity in the Kolumbo crater and in the NE sub-basin of the Santorini caldera. These surveys will provide much higher resolution maps of the venting areas than currently exist and will help to identify controlling structures on heat flow patterns and hydrothermal venting. AUV launch and recovery are daytime operations (launch in the evening, recover in the morning) but must allow for the possibility of night-time recovery in case of mission abort.

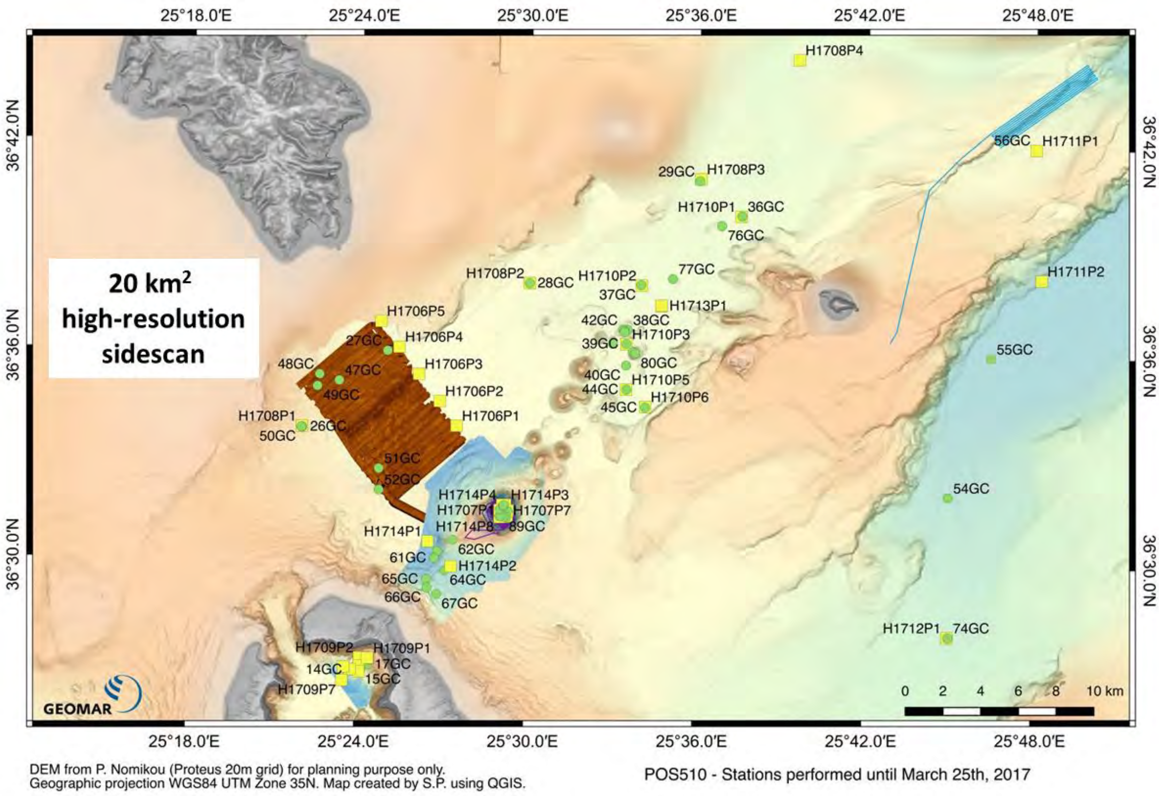


Figure 5: Station map of march 25 showing the location of 20 sq. km of high-resolution AUV-based sidescan surveys across the southwest termination of the Anydros Basin.

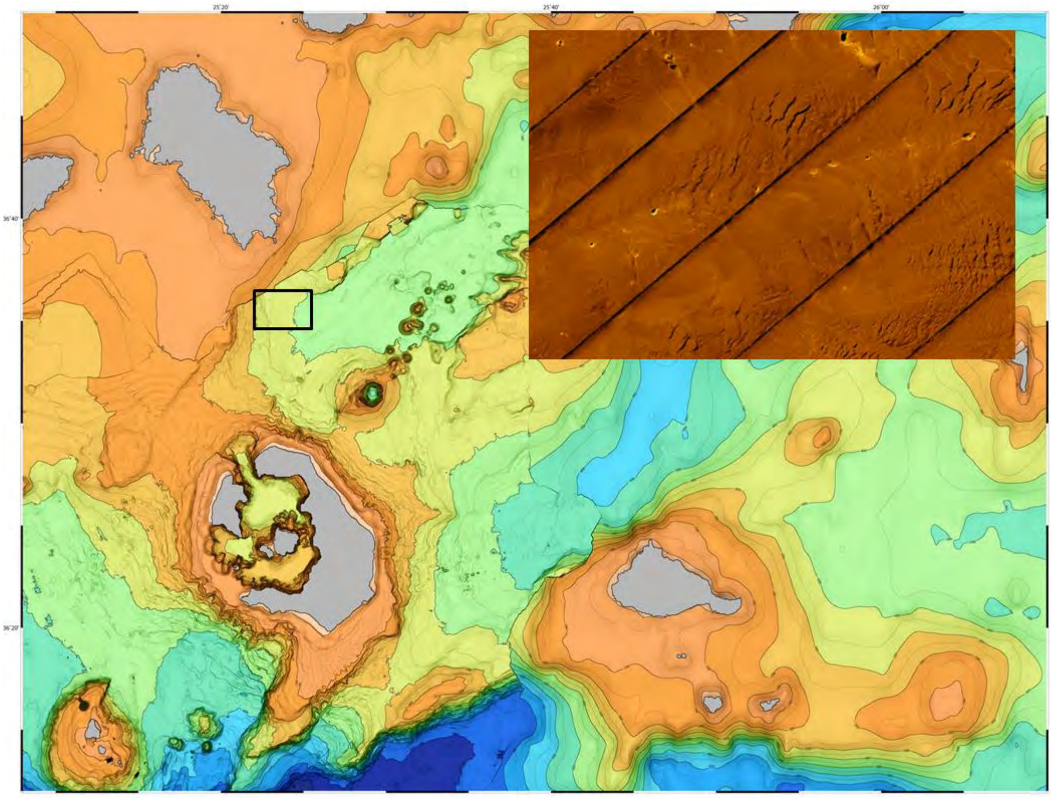


Figure 6: Basin floor expression in AUV-based sidescan data of ongoing extension in the southwest corner of the Anydros Basin. An active seafloor fault is indicates by a line of discrete pock marks or collapse features.

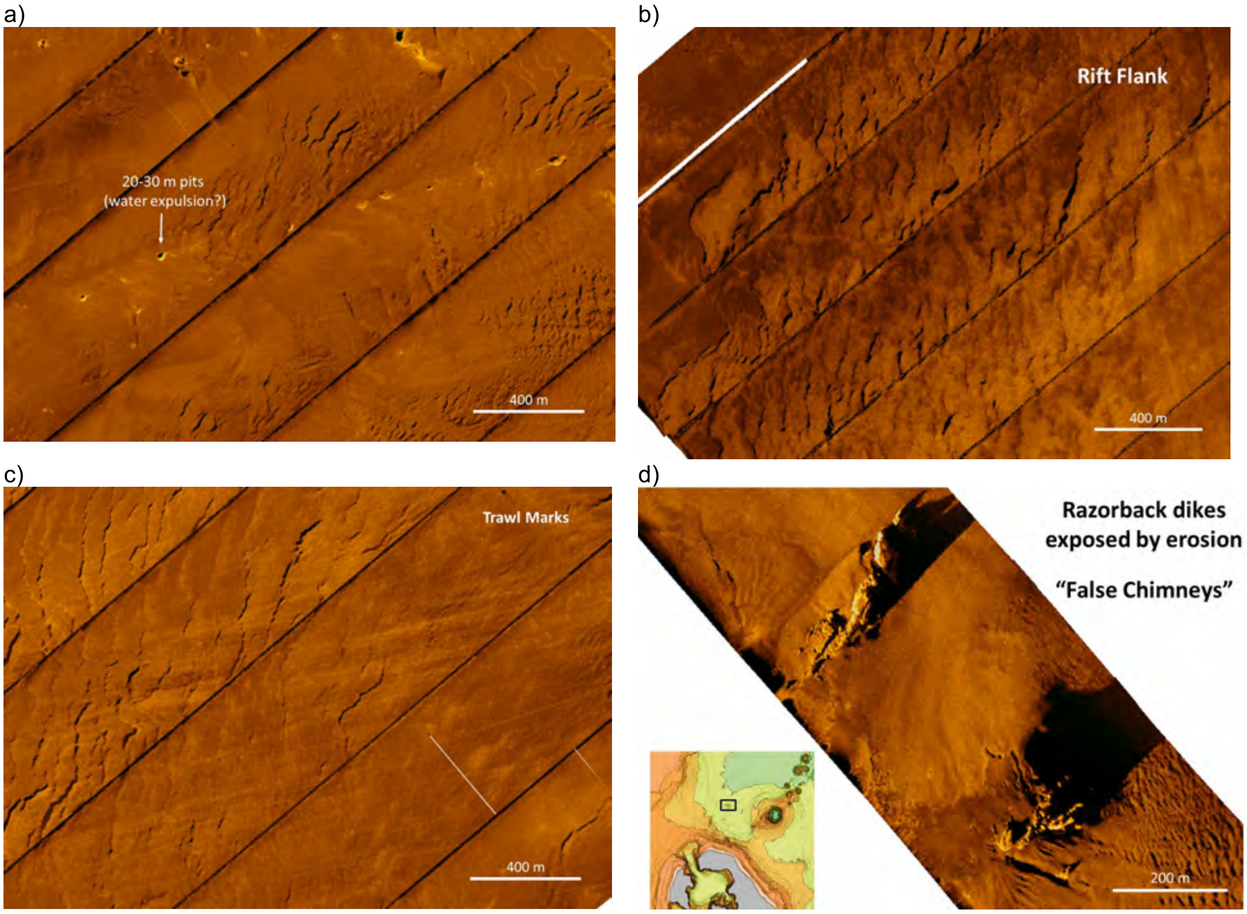


Figure 7: Selected views of AUV-based sidescan images showing a) seafloor fault and collapse features in the southwest Anydros Basin, b) beds of volcaniclastic material on the sloping inner flank of the Anydros Basin, c) probable trawl marks of fishing vessels at the bottom of the Anydros Basin, and d) exposures of "razorback" dikes on the north flank of Santorini. Sediment-coring and heat flow stations in this area revealed no hydrothermal activity.

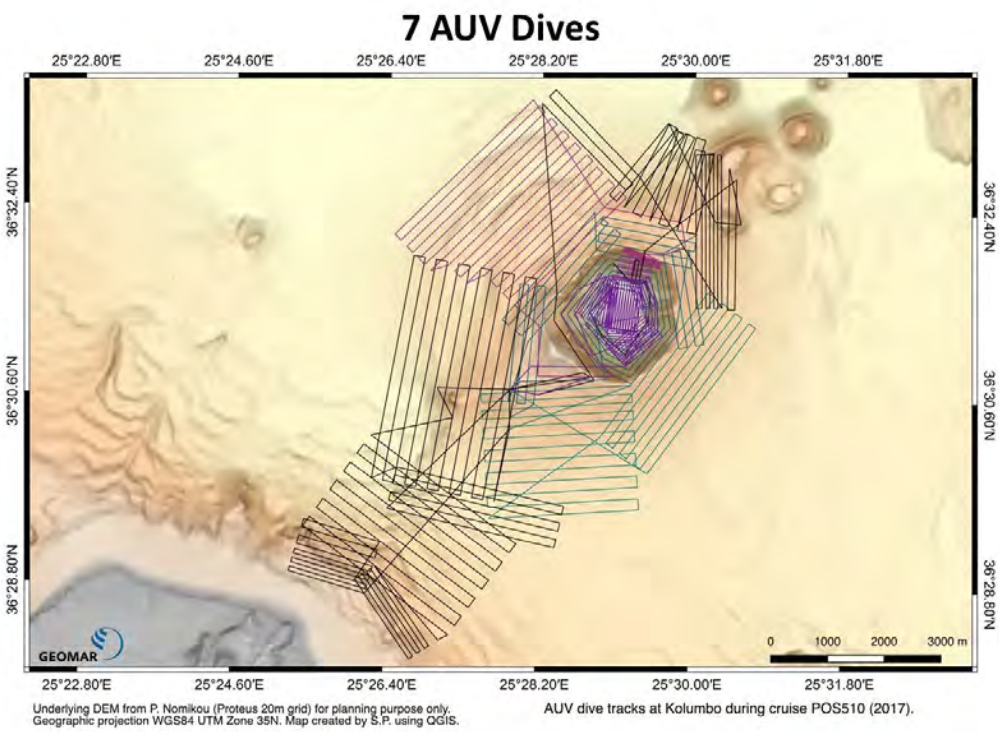


Figure 8: AUV mission plans for the Kolumbo volcano and Kolumbo line northeast of Santorini.

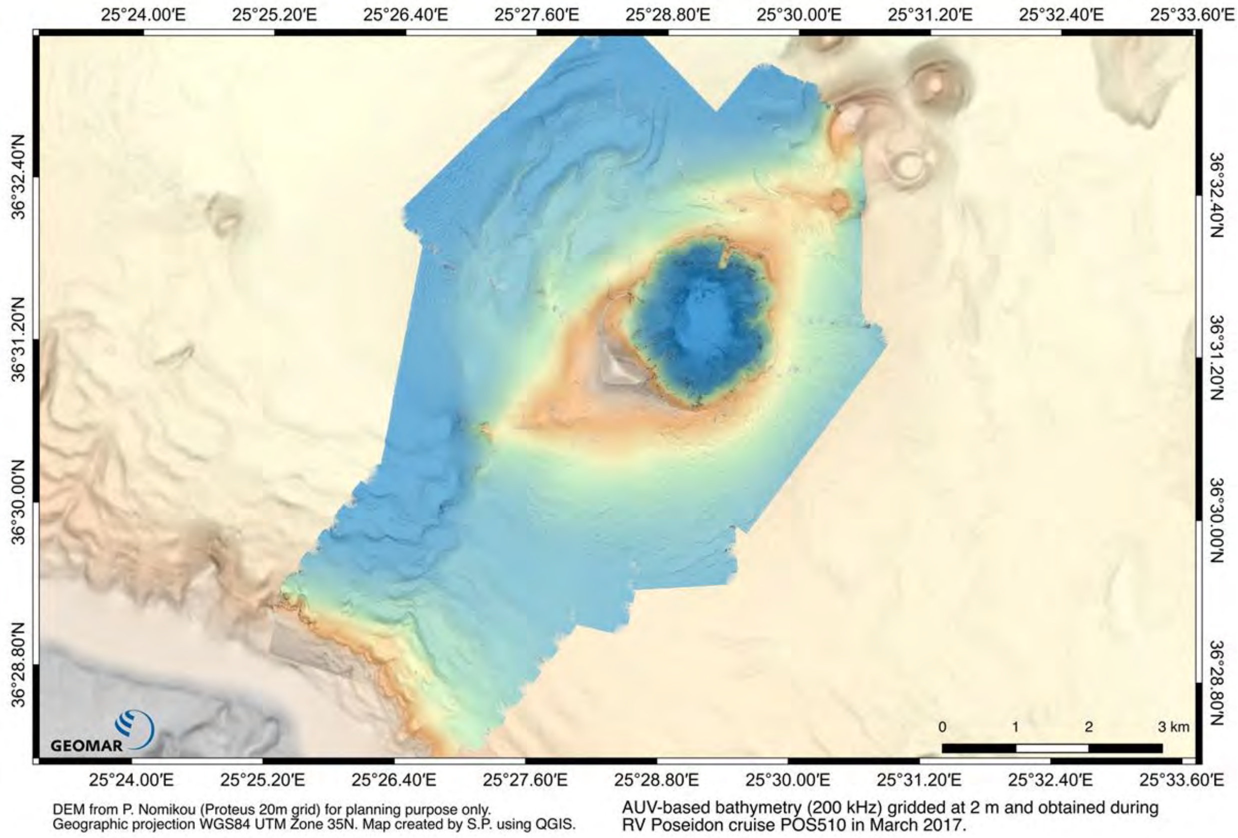


Figure 9: AUV multibeam compilation from 7 dives on Kolumbo volcano and Kolumbo line northeast of Santorini.

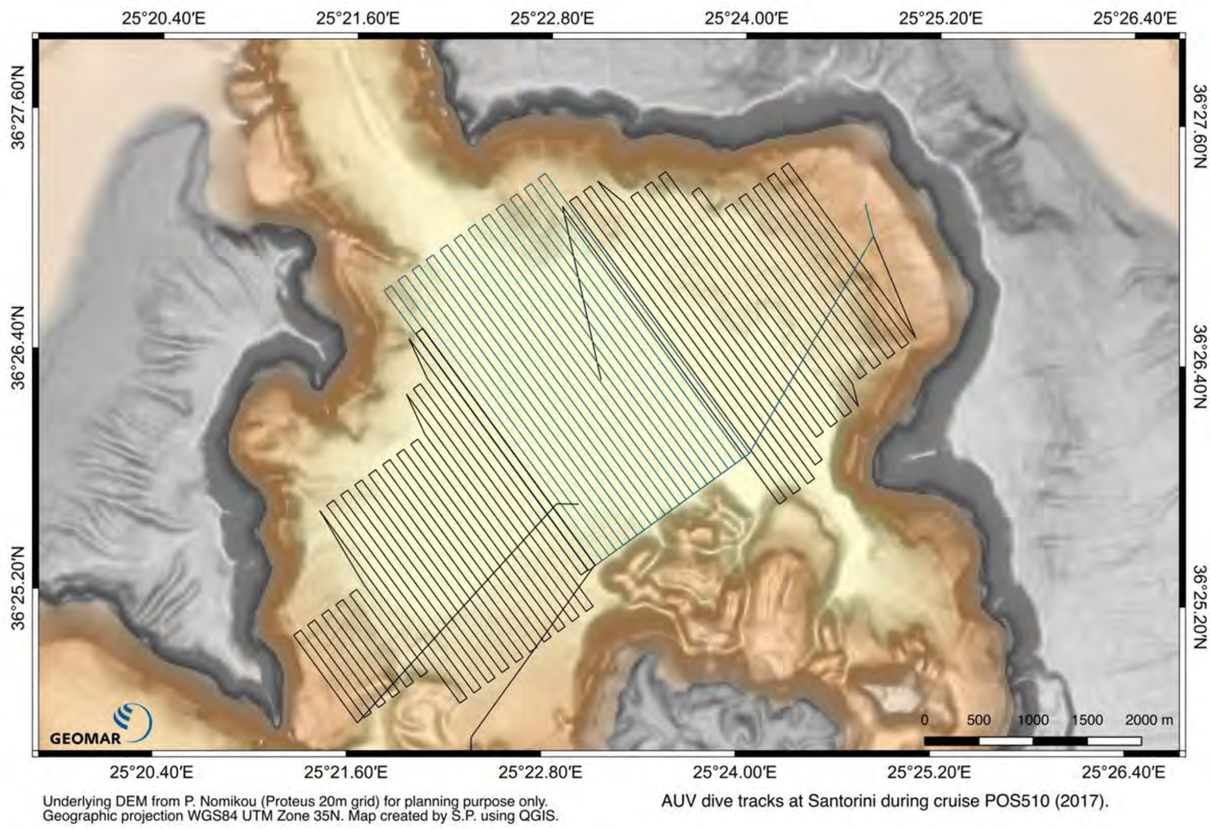


Figure 10: AUV mission plans for the Santorini Caldera.

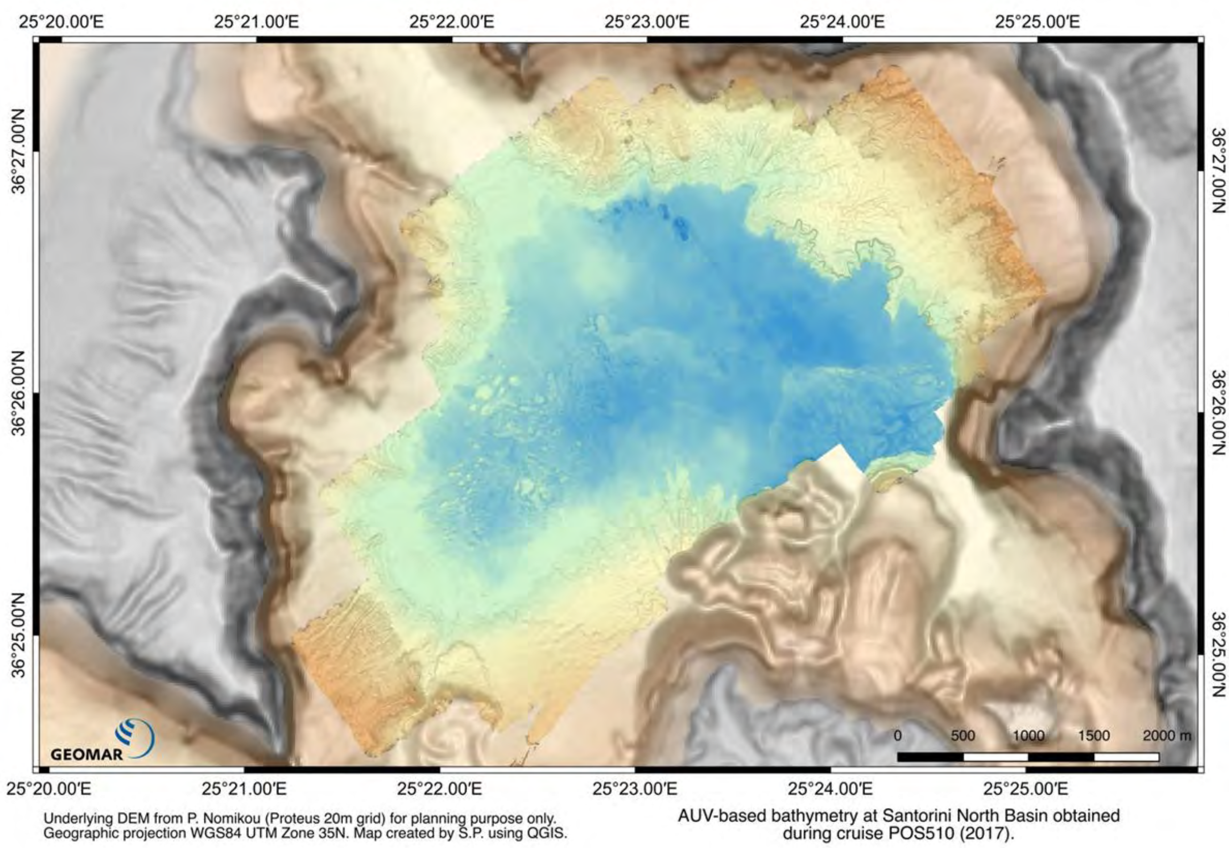


Figure 11: AUV multibeam compilation for the Santorini Caldera.

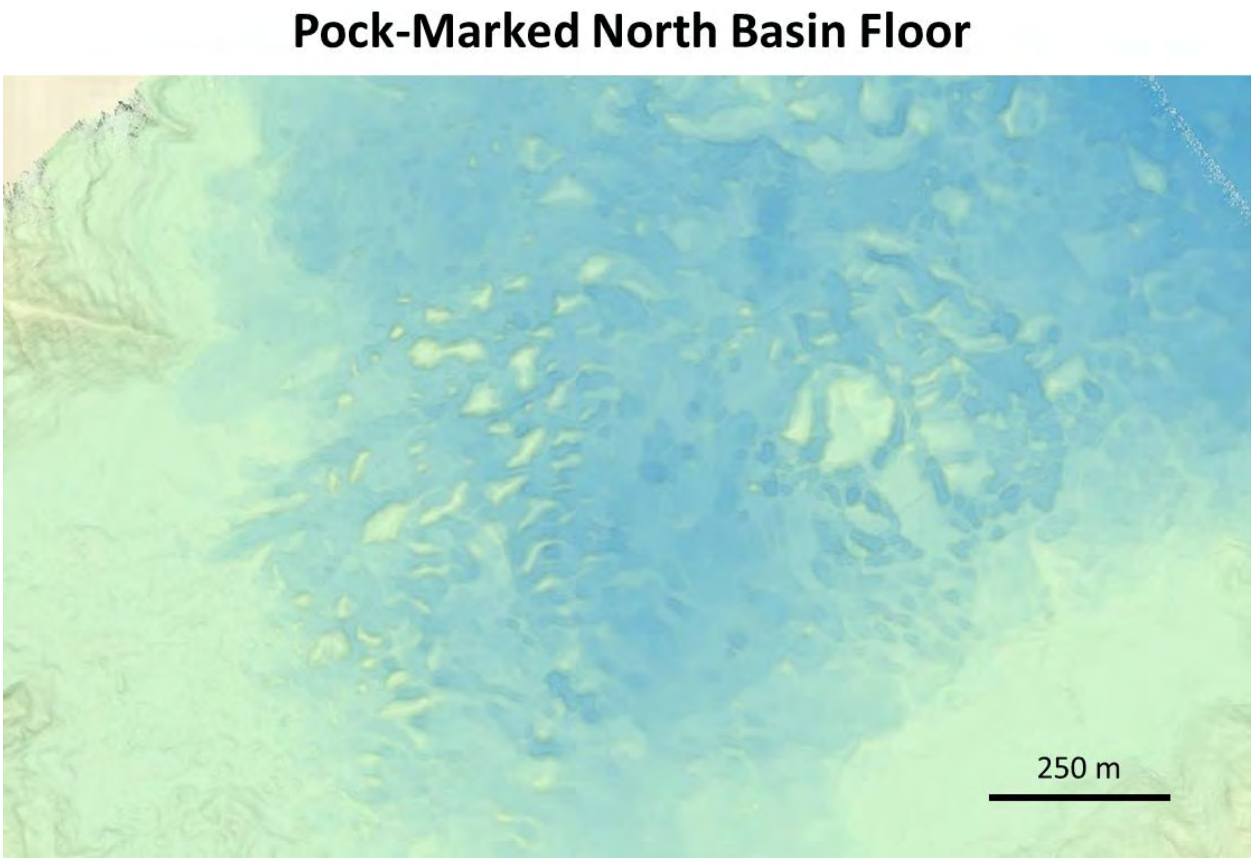


Figure 12: Clipped AUV multibeam of the northwest corner of the North Basin of Santorni Caldera.

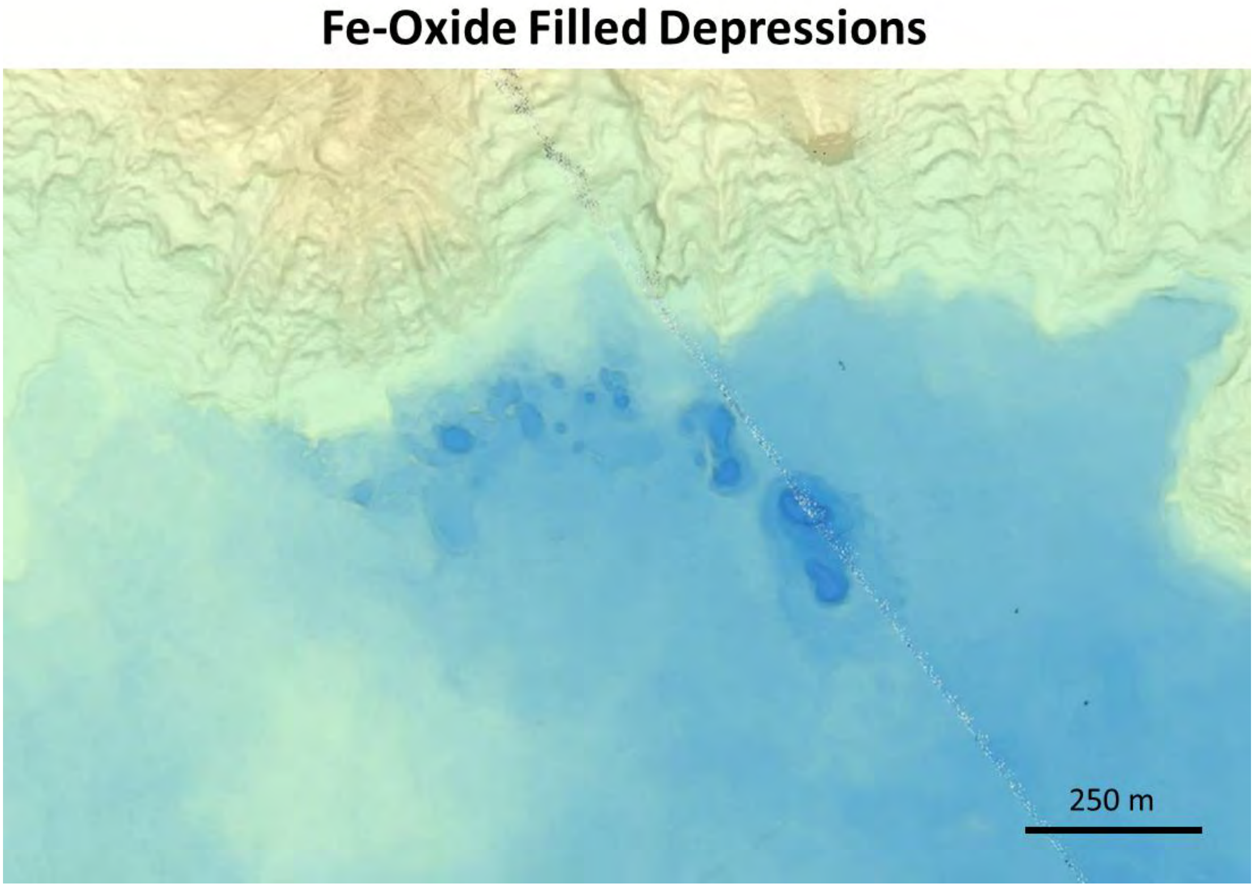


Figure 13: Clipped AUV multibeam of Fe-oxide filled depressions in the northern part of the North Basin of Santorni Caldera.

8.2 Heatflow

Heat flow measurements were made with a standard multipenetration approach and an outrigger thermistor chain on a coring instrument from GEOMAR. Because of the difficult-to-penetrate sediments and areas of higher-temperature hydrothermal venting, we used a specially redesigned heat flow probe (Modell FIELAX GmbH, Bremerhaven) consisting of a 2-m stainless steel lance attached to a modified gravity corer. Each station consisted of multiple penetrations of 15 minutes each for temperature and thermal conductivity measurement and 30-45 minutes for repositioning. Stations were located in the Anydros Basin, the Santorini-Anafi Basin, and across major faults already identified in seismic sections. Closely-spaced stations in the caldera of Kolumbo seamount and in Santorini caldera were made to determine the scale of the high-temperature upflow.

Heatflow protocals are provided in **Appendix 4**.

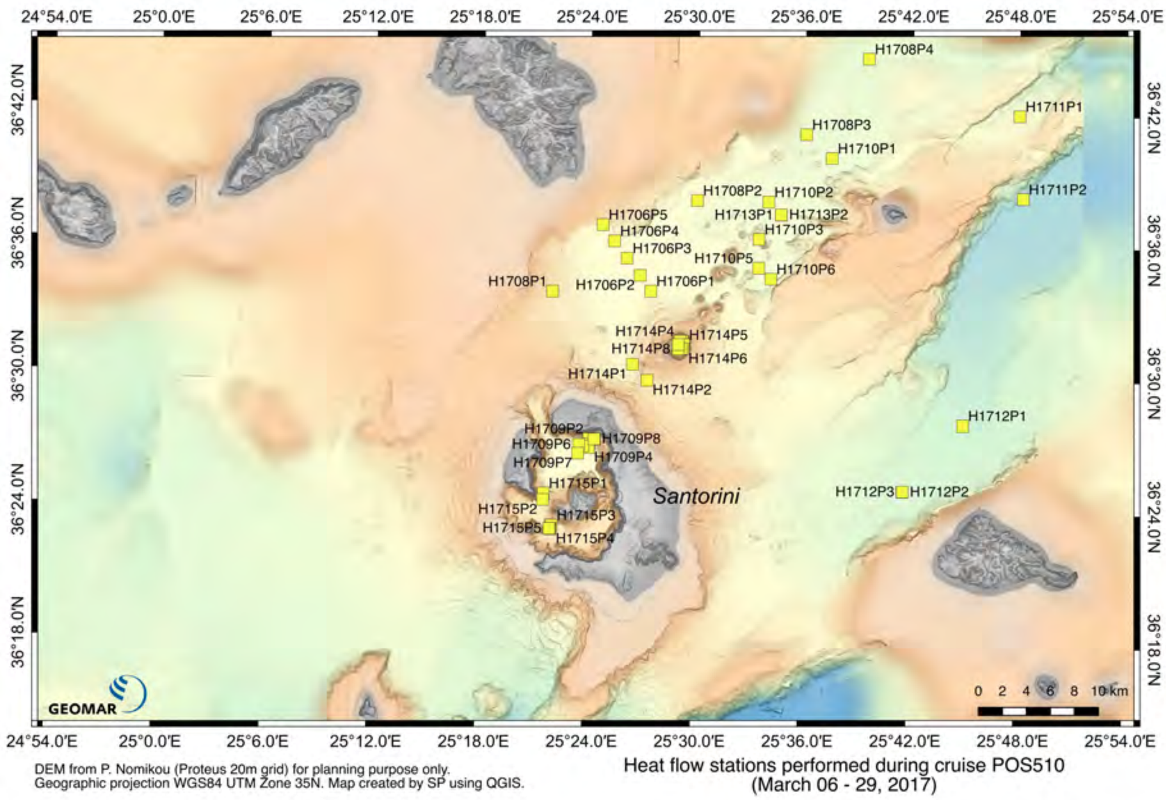


Figure 14: Distribution of heat flow stations during POS 510.

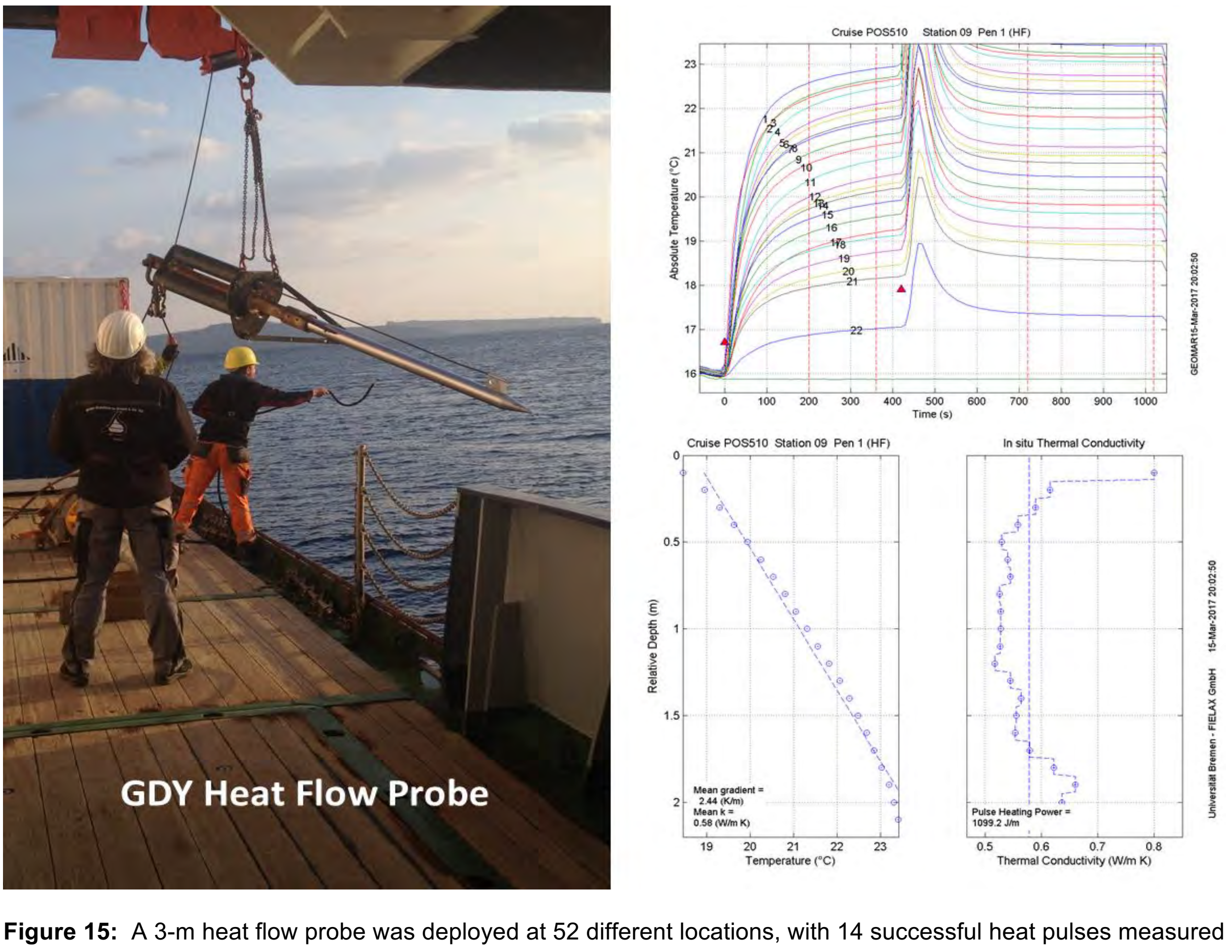


Figure 15: A 3-m heat flow probe was deployed at 52 different locations, with 14 successful heat pulses measured.

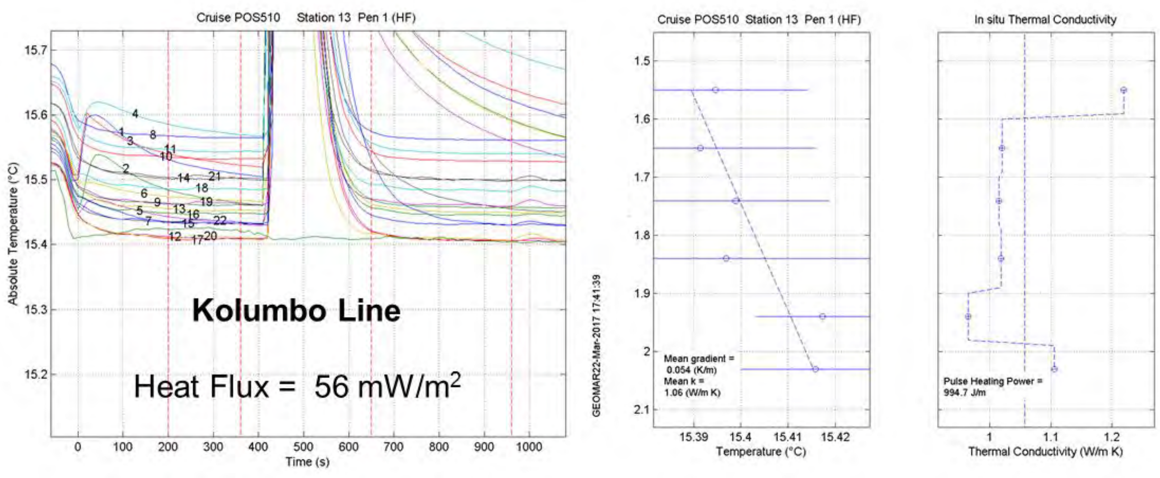


Figure 16: Example of positive heat flow anomaly measured following a heat pulse at station H1713P1 on the Kolumbo Line.

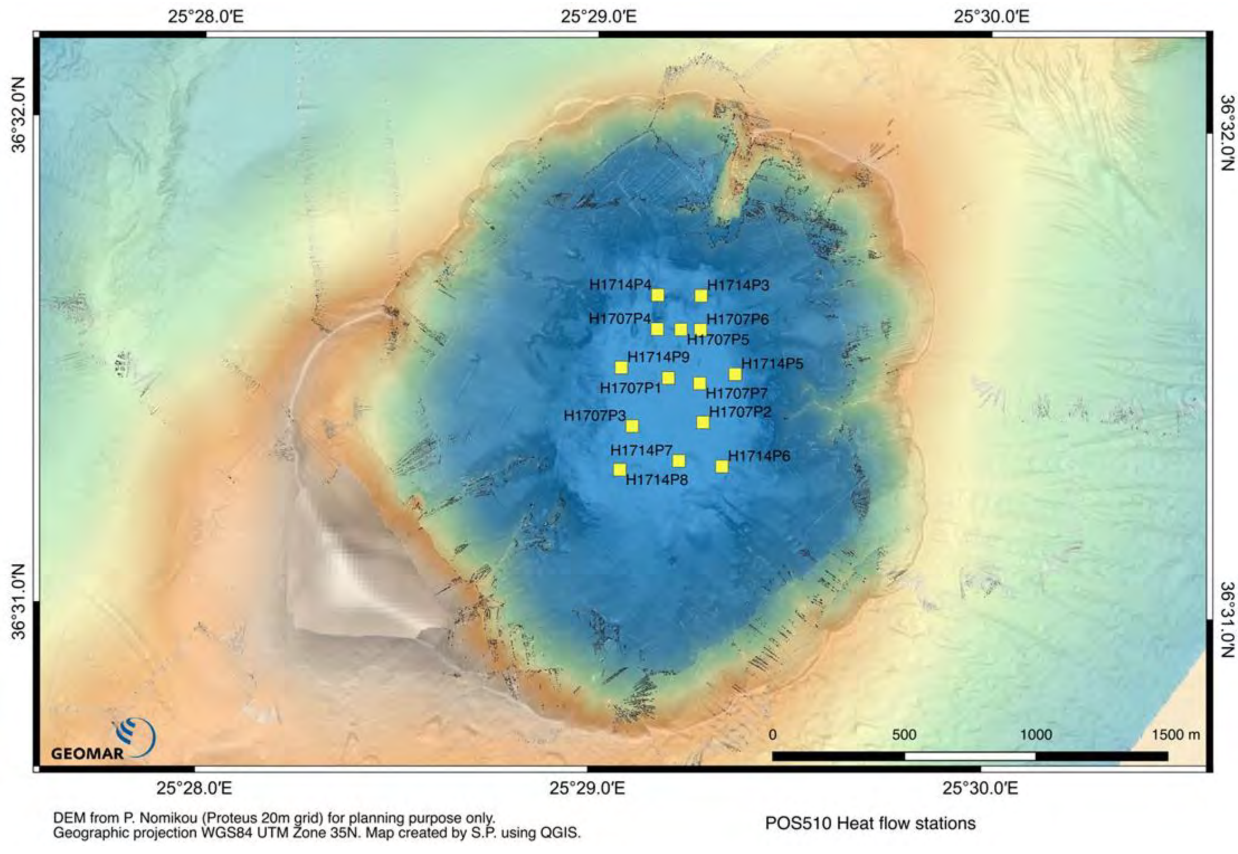


Figure 17: Location of heat flow stations in Kolumbo crater, surrounding the known area of hydrothermal venting.

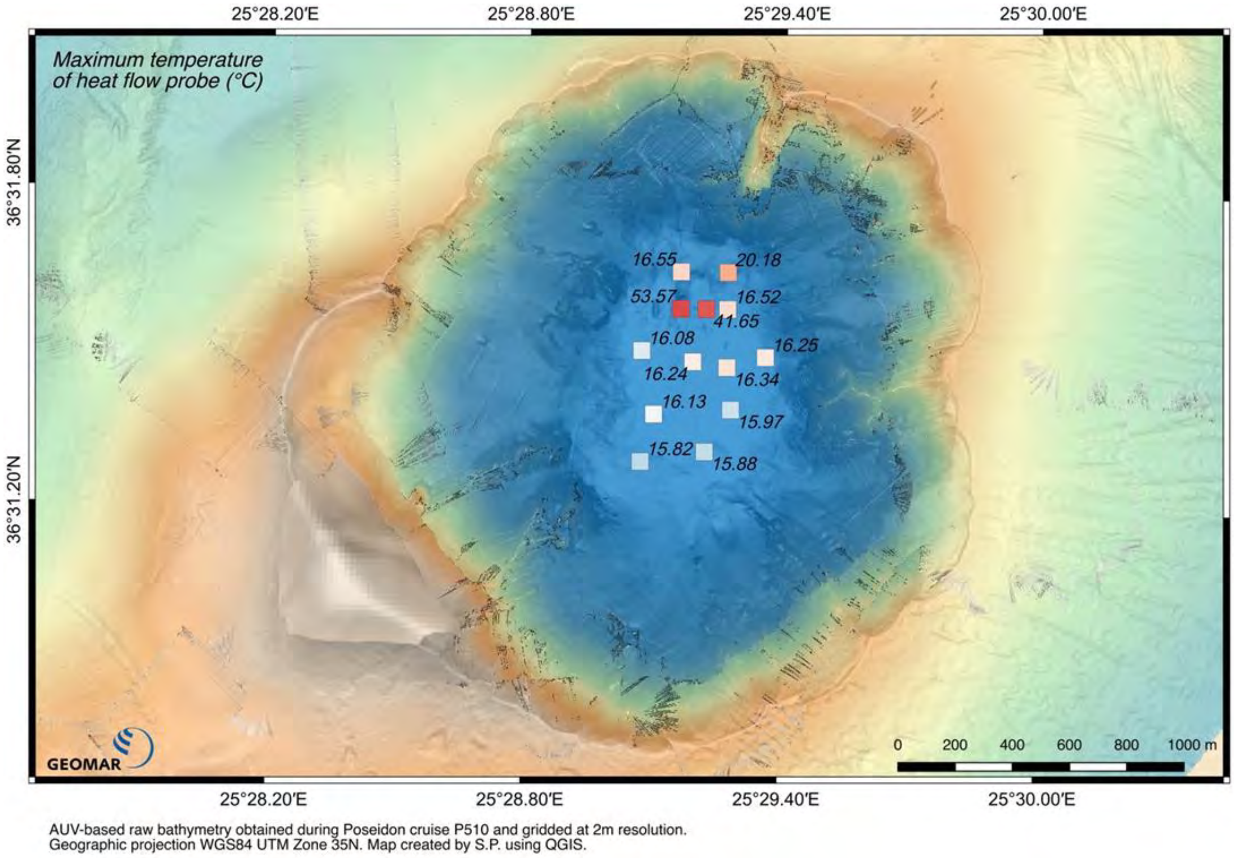


Figure 18: Bottom temperatures measured in heat flow survey of the Kolumbo crater.

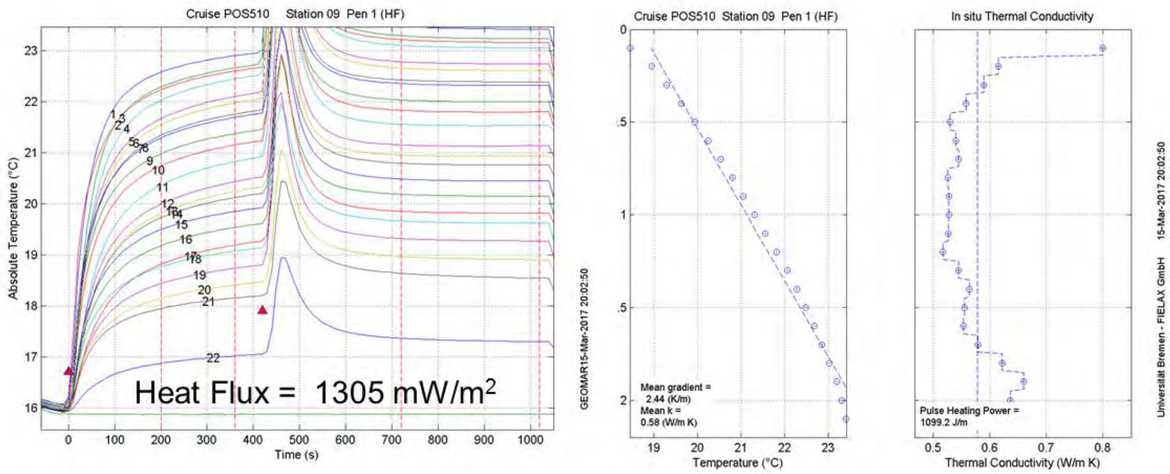


Figure 19: Positive heat flow anomaly measured following a heat pulse at station in Santorini Caldera.

8.3 Gravity Coring

82 gravity cores stations were located in the study area. A short (3-m) gravity corer was used to recover surface sediments in areas of dense clay or tephra layers. In general the ash layers are very fine grained (silt to clay) with less than about 10 cm of brown hemipelagic sediment at the top. Cores were collected in the Anydros Basin, Santorini-Anafi Basin, along the Kolumbo Line, in the area of hydrothermal venting in the Kolumbo crater, and throughout the North basin of the Santorini Caldera. This study focused on shallow sediments and hydrothermal alteration and complemented the deeper tephra coring by Freundt/Kutterolf et al. (POS 513).

Photo: A team of 4 scientists collected 310 sediment samples and 204 pore fluid samples from 82 gravity core stations

Core handling:

Upon recovery, the first operation was removal of the core catcher and measurement of several parameters (pH, Eh and temperature) with a portable multi-parameter probe (Lange SenSion) in the sediment. The liners containing the sediment were cut into 1 m long sections and the multi-parameter measurements were repeated for the bottom of each core section. The ends of the liner sections were sealed with caps and the sections were transferred to the “wetlab” for further processing. The core sections were split longitudinally using a hand-held, power disc-saw (Fein-Multimaster), opened in two halves, photographed, described and subsampled for pore waters and bulk geochemistry (see below). After subsampling both halves were stored in plastic sleeves and heat-sealed. Working half and archive half will be stored at the core repository of GEOMAR.

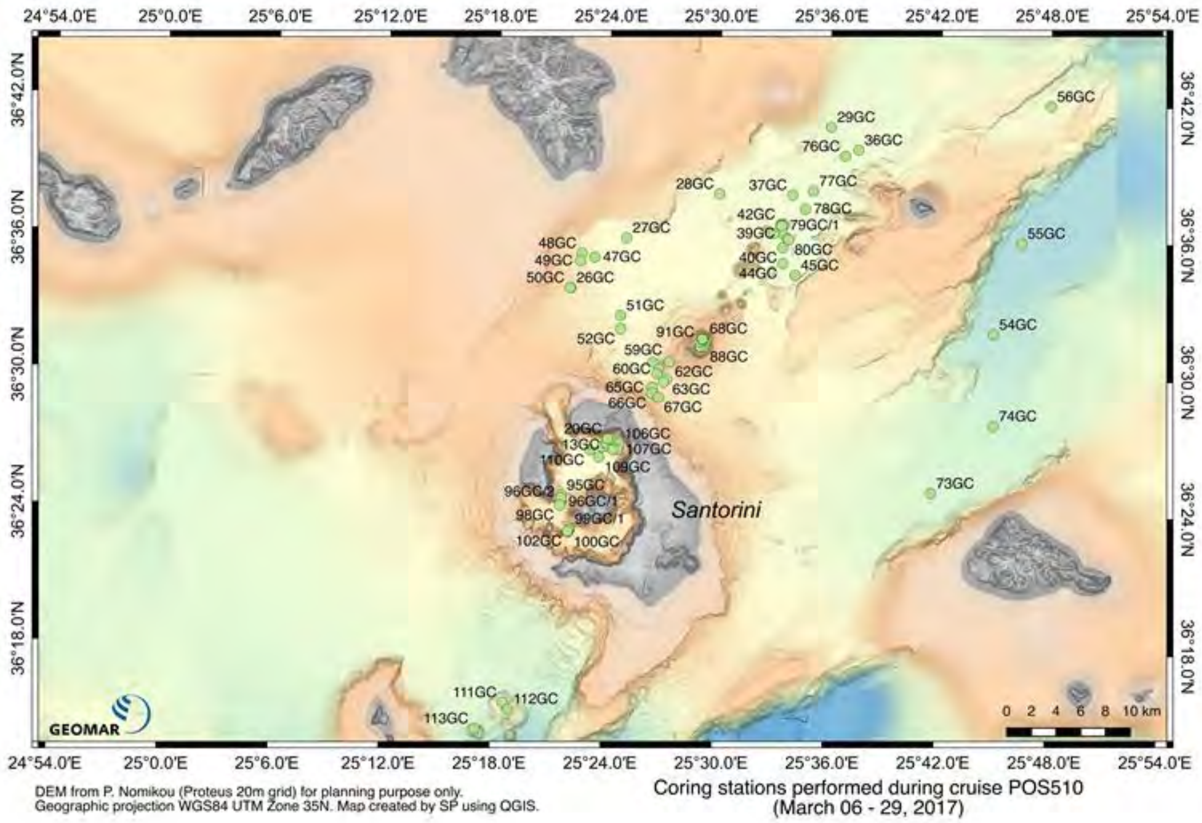


Figure 20: Locations of gravity coring stations during POS 510.

Photo: Core handling on the deck of R/V POSEIDON.

Pore fluid extraction:

Pore fluids were extracted from the open core using Rhizon Soil Moisture samplers. These samplers consist of a small microporous polymer tube (0.2 µm pore size) that is supported by a stabilizing glass fibre wire and connected to a PVC tube (Seeberg-Elverfeldt *et al.*, 2005). The pore water was recovered using negative pressure produced by the attached 20 mL syringes (Luer-Lock connection). Small dead volume (< 0.5 mL) allows sampling of very small volumes of pore water. The applied method permitted extraction of the pore water with minimal disturbance of the sediment. Before usage all Rhizon soil moisture samplers had been thoroughly cleaned and stored in artificial seawater of approximately Mediterranean salinity (36 g salt in 1 L Milli-Q water). Pore fluids sampled with Rhizon samplers are *in-situ* filtrated by principle through the micro-porous membrane. The pore fluids were transferred from the syringe into acid-cleaned 20ml HDPE mini vials. From this pore fluid one aliquot (3 ml) was transferred into an acid-cleaned 3ml HDPE mini vial and acidified with 30 µl concentrated subb. HNO_3. The remaining pore fluid was kept as original sample without further treatment. A total of 204 pore fluid samples (including method blanks and duplicates) were sampled for subsequent analysis on shore.

Sediment sampling:

Sediment samples for geochemical analyses were taken at the same depths as pore fluid samples whenever possible. Sampling was done using 20ml syringes or by using a spatula for hard layers or crusts. Samples were transferred to plastic zip bags. For the determination of bulk chemical composition all sediment samples will be homogenized, dried, milled and dissolved following a multi-step mixed acid protocol. Subsamples will also be analyzed by Neutron Activation in a commercial certified lab (ACTLABS, Canada) for selected trace elements. A total of 310 sediment samples were stored for subsequent analysis.

In order to better characterize the sample intervals a hand-held colorimeter (Spectrophotometry - CM - Konica Minolta 700d) was used to record the color and visible reflection parameters including the Munsell sediment parameters. The archive half cores were covered with spectrophotometrically tested film (Glad®) to enable contact of the colorimeter sensor. The spots chosen for subsampling (porefluids and sediments) were also analyzed for pH and Eh using a multi-sensor probe (Lange senSION + portable meter and 50 45 Probe), if possible.

Figure 21: Example of grey-brown clay and dark grey-black ash layer in sediments of the Anydros Basin. Adjacent to the Amorgos Fault, several meters of grey mud were recovered, bottoming in a 5 cm ash layer with notable fluid escape structures in fractures in the overlying mud. These are most likely related to seismic activity of the Amorgos Fault.

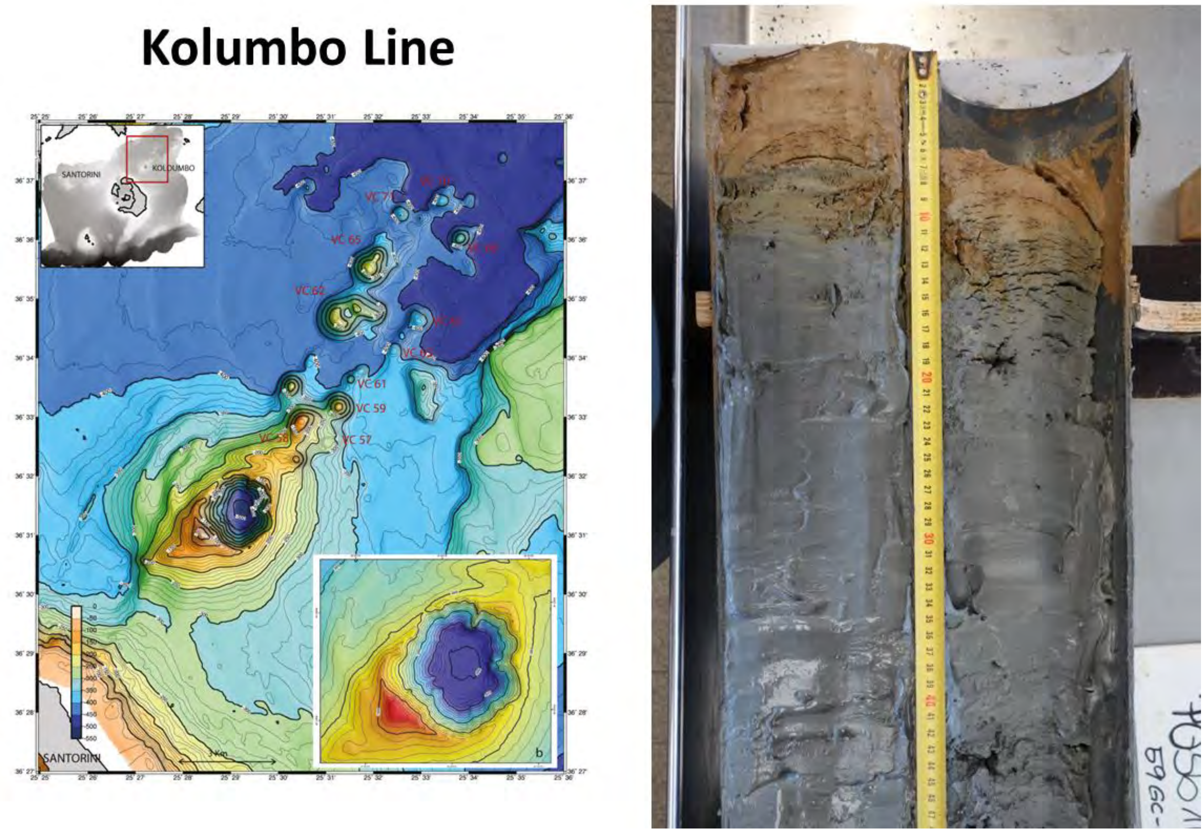


Figure 22: Example of top lyaer of oxidized mud and typical dark-grey, reduced clay typical of sediments along the line of volcanoes northeast of Kolumbo.

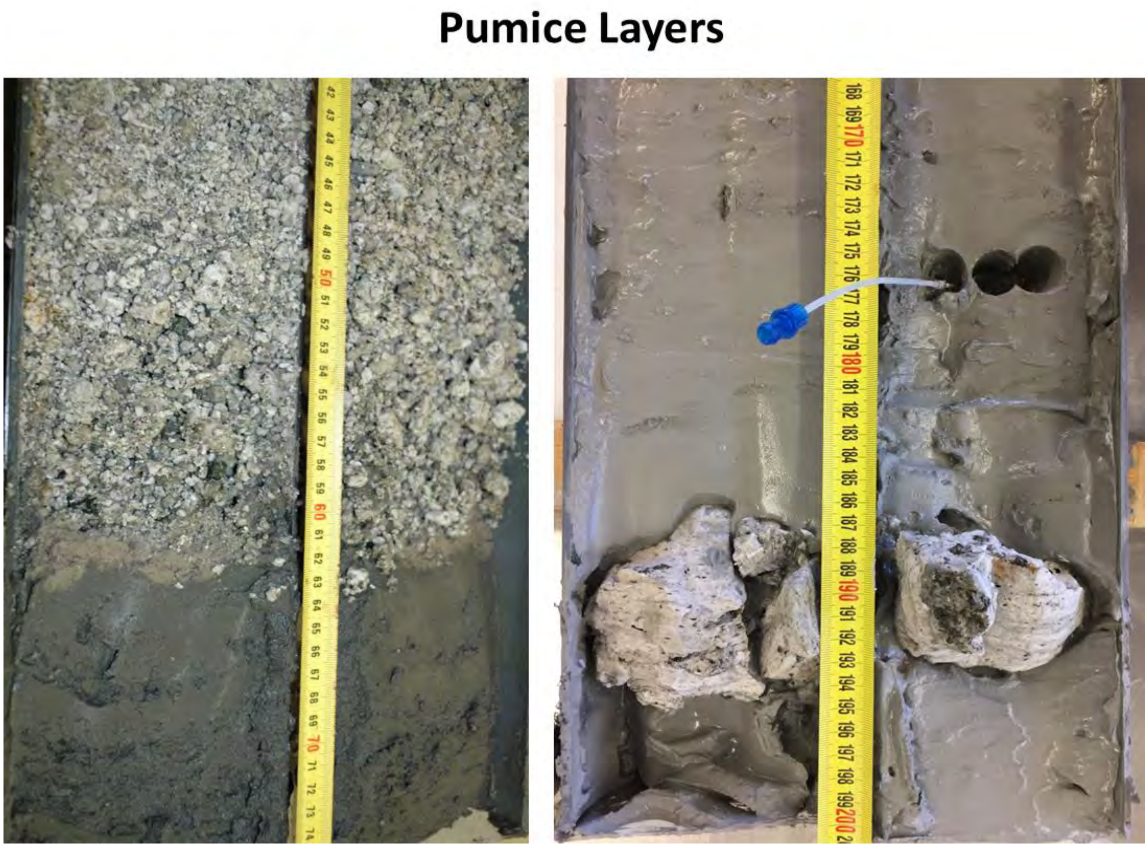


Figure 23: Examples of pumice layers and clasts found along the Kolumbo Line.

Figure 24: Locations of gravity coring stations in the Kolumbo crater surrounding the area of known hydrothermal venting.

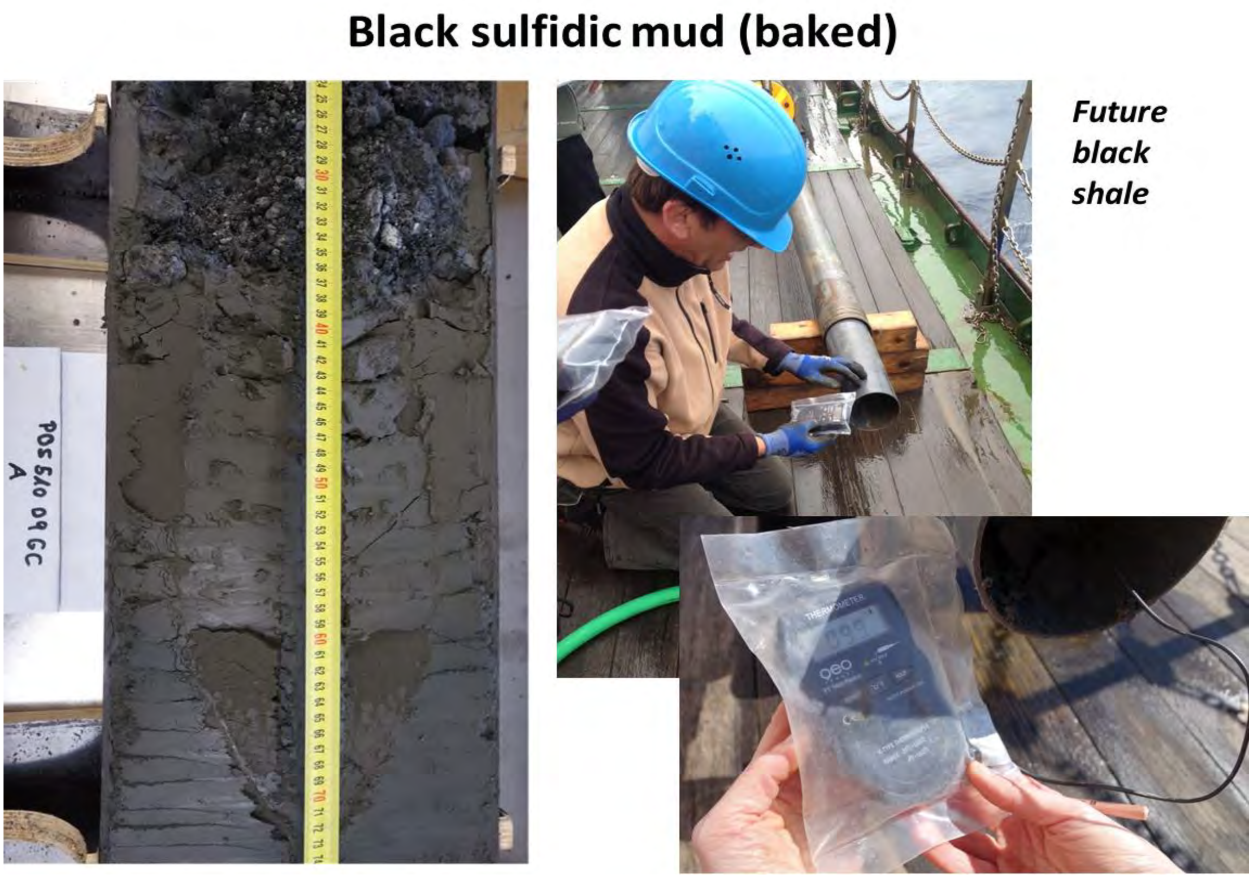


Figure 25: Typical hardened black sulfidic mud in the area of active venting in Kolumbo crater (99 degreec measured at the bottom of the core while on deck).

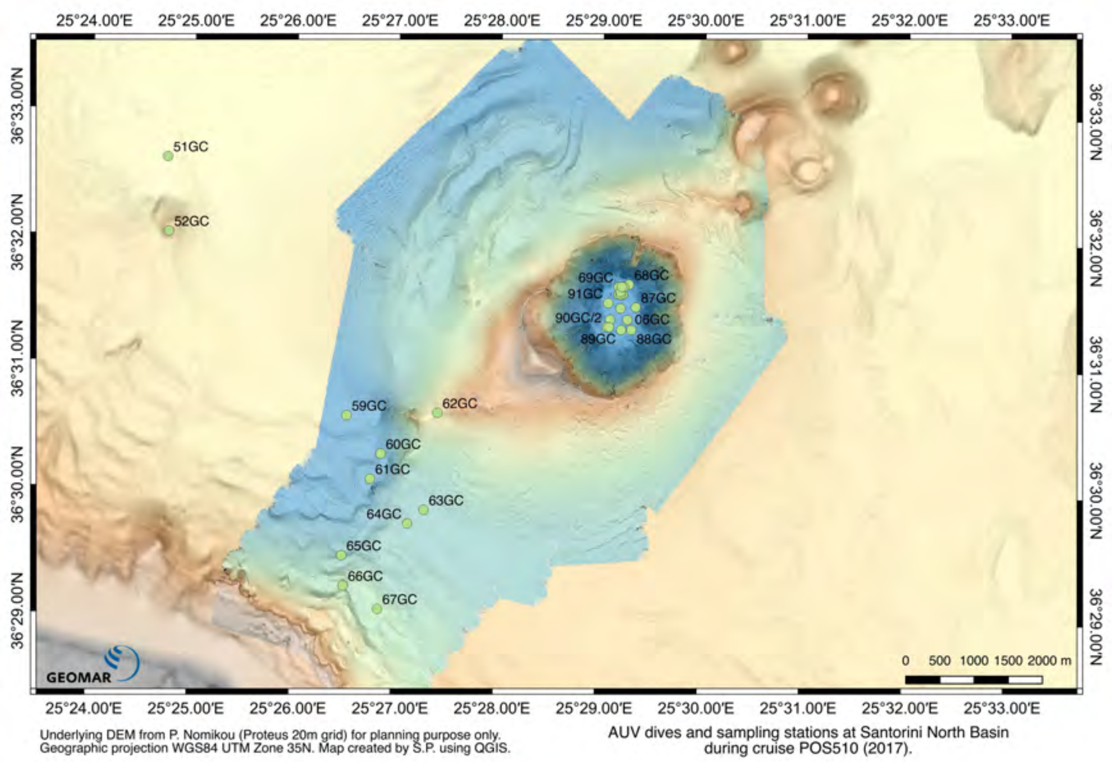


Figure 26: Locations of gravity core stations on the Kolumbo Line between Kolumbo and Santorini.

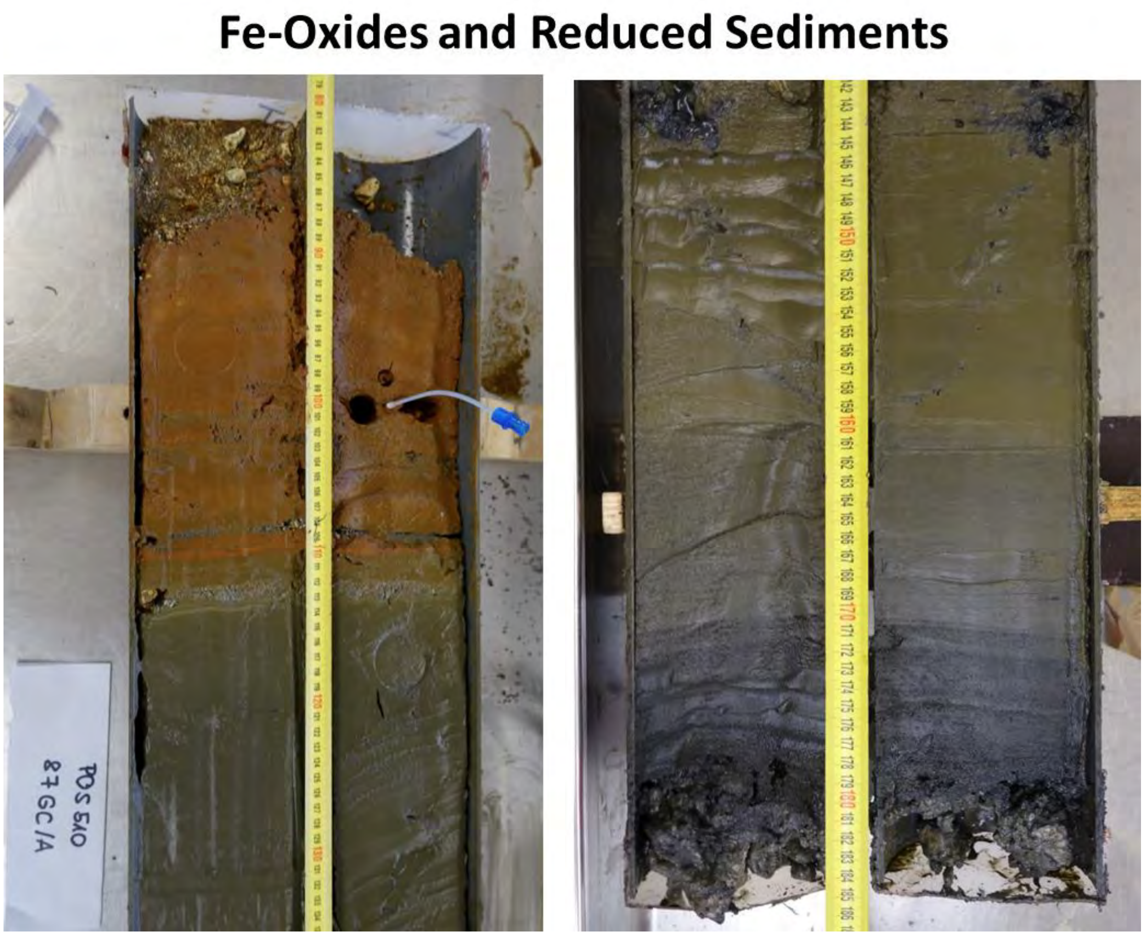


Figure 27: Typical Fe-oxides and reduced clay-rich sediment at the edge of the hydrothermal field in Kolumbo crater.

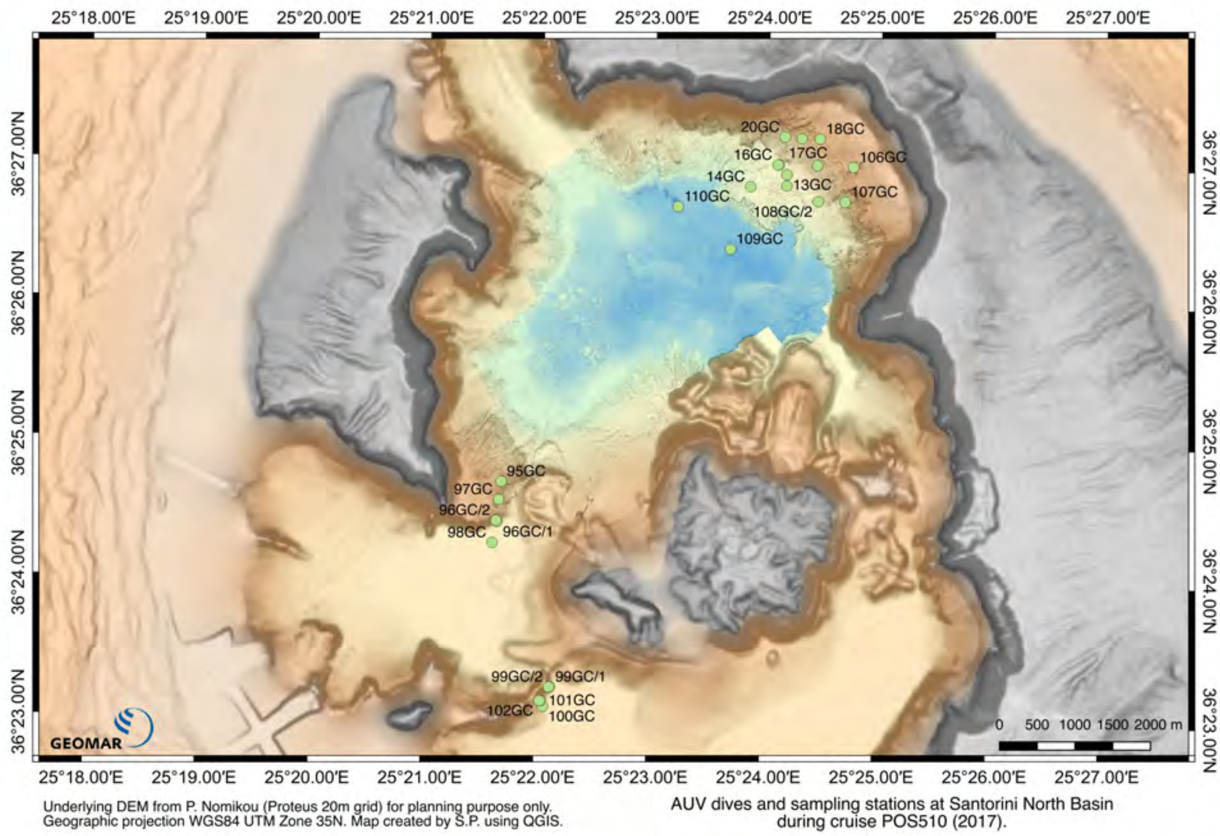


Figure 27: Locations of gravity core stations in Santorini Caldera.

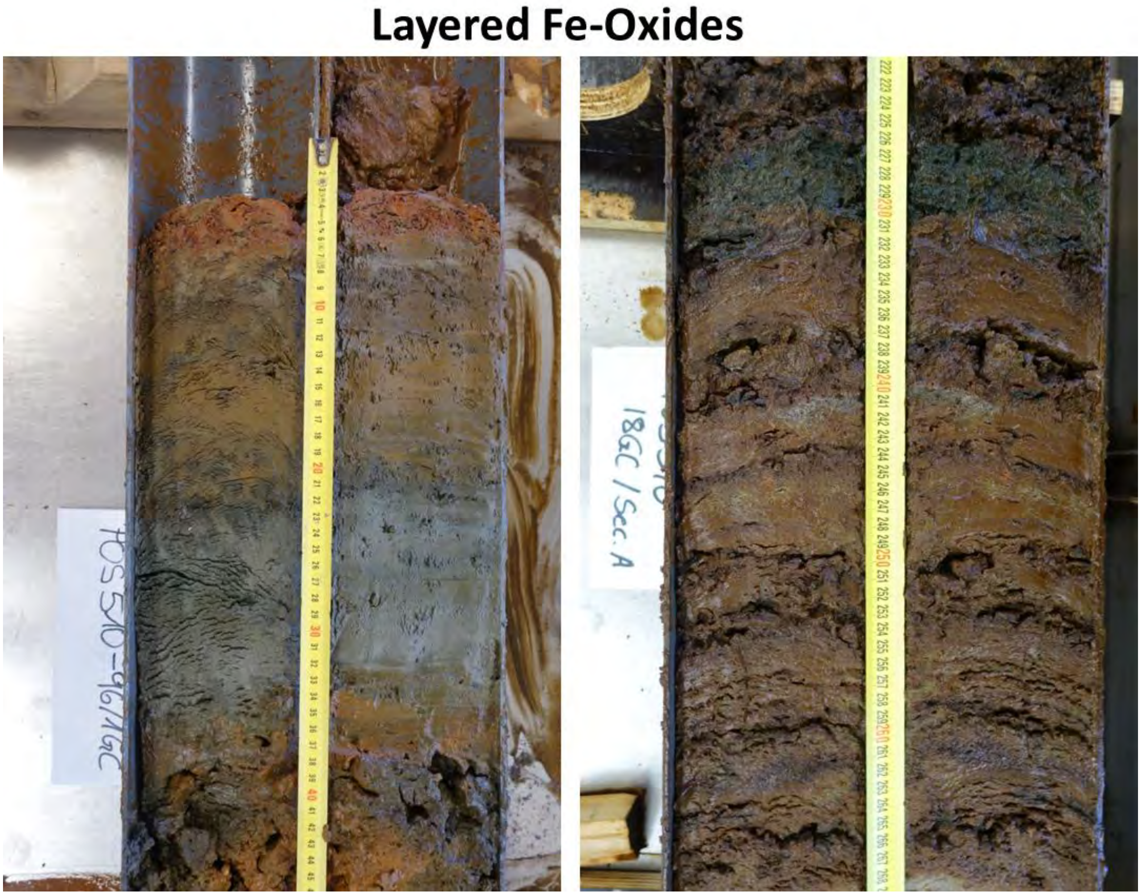


Figure 30: Typical layered Fe-oxides in the hydrothermal field in the northeast part of Santorini Caldera along the Kolumbo line.

9. Acknowledgements

The Master and crew of R/V POSEIDON are to be commended for enabling us to exceed our scientific objectives, safely and efficiently. Operations were carried out with no interruptions and without incident. The skill of the deck handling crew made this successful program possible. Accommodations and meals were superior, and logistical support for the scientific crew flawless. The treatment of the science team by the ship's crew was patient, friendly and cordial, as always. This was an important international cooperation project with Greek colleagues, and the Captain and crew were perfect hosts.

We particularly wish to thank Professor P. Nomikou for her assistance in preparing the cruise proposal and the documentation for the diplomatic clearance, and for generously sharing her time and support to achieve our objectives.

Appendix 1: Station List

Ship's Log POSEIDON	Sample Number	Gear	Date	Time	Latitude	Longitude	Depth (m)
POS510/01	01/HF	Heatflow	09.03.17	06:05 12:18	36°33.90'N 36°36.83'N	25°27.50'E 25°24.76'E	400 361
POS510/02	02/AUV	AUV	09.03.17 10.03.17	14:26 06:21	36°30.69'N 36°33.79'N	25°27.84'E 25°26.49'E	123 127
POS510/03	03/GC	Gravity Core	10.03.17	07:22 07:43	36°31.58'N	25°29.22'E	490
POS510/04	04/GC	Gravity Core	10.03.17	08:12 08:31	36°31.58'N	25°29.18'E	489
POS510/05	05/GC	Gravity Core	10.03.17	08:54 09:15	36°31.38'N	25°29.10'E	489
POS510/06-1	06/GC	Gravity Core	10.03.17	10:31 11:00	36°31.38'N	25°29.28'E	491
POS510/06-2	07/GC (repeat of 06/GC)	Gravity Core	10.03.17	11:05 11:27	36°31.38'N	25°29.27'E	491
POS510/07	08/GC	Gravity Core	10.03.17	11:53 12:19	36°31.47'N	25°29.20'E	490
POS510/08	09/GC	Gravity Core	10.03.17	12:48 13:10	36°31.58'N	25°29.23'E	490
POS510/09	10/AUV	AUV	10.03.17 11.03.17	14:53 06:06	36°30.72'N 36°33.76'N	25°27.84'E 25°26.93'E	127 127
POS510/10	11/HF	Heatflow	11.03.17	07:12 13:12	36°31.48'N 36°31.41'N	25°29.19'E 25°29.25'E	491 493
POS510/11	12/AUV	AUV	11.03.17 12.03.17	16:49 06:14	36°27.05'N 36°26.27'N	25°24.80'E 25°23.15'E	180 196
POS510/12	13/GC	Gravity Core	12.03.17	06:53 07:07	36°27.01'N	25°24.141'E	334
POS510/13-1	14/GC	Gravity Core	12.03.17	07:30 07:42	36°26.96'N	25°24.17'E	331
POS510/13-2	15/GC (repeat of 14/GC)	Gravity Core	12.03.17	08:00 08:12	36°26.94'N	25°24.18'E	331
POS510/14	16/GC	Gravity Core	12.03.17	08:33 08:46	36°26.85'N	25°23.85'E	349
POS510/15	17/GC	Gravity Core	12.03.17	09:09 09:21	36°26.86'N	25°24.17'E	329
POS510/16	16/GC-B	Gravity Core	12.03.17	10:34 10:48	36°27.01'N	25°24.10'E	337
POS510/17	17/GC-B	Gravity Core	12.03.17	11:16 11:27	36°27.01'N	25°24.44'E	276
POS510/18	18/GC	Gravity Core	12.03.17	11:49 12:00	36°27.20'N	25°24.46'E	216
POS510/19	19/GC	Gravity Core	12.03.17	12:25 12:35	36°27.20'N	25°24.30'E	250
POS510/20	20/GC	Gravity Core	12.03.17	12:55 13:07	36°27.21'N	25°24.15'E	288

Ship's Log POSEIDON	Sample Number	Gear	Date	Time	Latitude	Longitude	Depth (m)
POS510/21	21/HF	Heatflow	13.03.17	06:04 06:35	36°33.82'N 36°33.82'N	25°21.99'E 25°22.01'E	305 305
POS510/22	22/HF	Heatflow	13.03.17	07:44 08:44	36°38.01'N 36°38.52'N	25°30.04'E 25°30.99'E	417 418
POS510/23	23/HF	Heatflow	13.03.17	09:57 10:48	36°41.06'N 36°41.02'N	25°36.07'E 25°36.08'E	449 453
POS510/24	24/HF	Heatflow	13.03.17	11:38 12:20	36°44.53'N 36°44.49'N	25°39.63'E 25°39.58'E	472 472
POS510/25	25/AUV	AUV	13.03.17 14.03.17	15:14 07:51	36°30.72'N 36°34.12'N	25°27.83'E 25°24.55'E	119 336
POS510/26	26/GC	Gravity Core	14.03.17	08:39 08:51	36°33.80'N	25°22.01'E	305
POS510/27	27/GC	Gravity Core	14.03.17	10:16 10:31	36°36.02'N	25°25.01'E	390
POS510/28	28/GC	Gravity Core	14.03.17	11:33 11:47	36°38.01'N	25°30.02'E	418
POS510/29	29/GC	Gravity Core	14.03.17	12:44 13:00	36°41.00'N	25°36.03'E	451
POS510/30	30/AUV	AUV	14.03.17 15.03.17	16:35 06:11	36°30.53'N 36°30.57'N	25°27.75'E 25°27.71'E	174 176
POS510/31	31/HF	Heatflow	15.03.17	08:00 15:33	36°27.18'N 36°27.20'N	25°24.67'E 25°24.44'E	216 214
POS510/32	32/HF	Heatflow	16.03.17	06:03 06:38	36°40.01'N 36°40.02'N	25°37.53'E 25°37.57'E	472 471
POS510/33	33/HF	Heatflow	16.03.17	07:22 07:53	36°38.00'N 36°38.02'N	25°34.02'E 25°34.03'E	456 457
POS510/34	34/HF	Heatflow	16.03.17	08:27 12:59	36°36.30'N 36°34.55'N	25°33.49'E 25°34.15'E	445 451
POS510/35	35/AUV	AUV	16.03.17 17.03.17	14:57 03:53	36°30.72'N 36°31.10'N	25°27.84'E 25°29.63'E	122 491
POS510/36	36/GC	Gravity Core	17.03.16	06:11 06:28	36°40.01'N	25°37.56'E	471
POS510/37	37/GC	Gravity Core	17.03.16	07:09 07:25	36°38.00'N	25°33.99'E	456
POS510/38	38/GC	Gravity Core	17.03.16	07:53 08:07	36°36.71'N	25°33.53'E	394
POS510/39	39/GC	Gravity Core	17.03.16	08:32 08:48	36°36.31'N	25°33.50'E	447
POS510/40	40/GC	Gravity Core	17.03.16	10:32 10:49	36°35.69'N	25°33.49'E	437
POS510/41	41/GC	Gravity Core	17.03.16	11:00 11:17	36°36.08'N	25°33.73'E	345
POS510/42	42/GC	Gravity Core	17.03.16	11:36 11:52	36°36.72'N	25°33.37'E	360
POS510/43	43/GC	Gravity Core	17.03.16	12:11 12:25	36°36.32'N	25°33.00'E	415

Ship's Log POSEIDON	Sample Number	Gear	Date	Time	Latitude	Longitude	Depth (m)
POS510/44	44/GC	Gravity Core	17.03.16	12:51 13:07	36°35.00'N	25°33.51'E	449
POS510/45	45/GC	Gravity Core	17.03.16	13:29 13:46	36°34.49'N	25°34.19'E	450
POS510/46	46/AUV	AUV	17.03.17 18.03.17	15:33 06:12	36°30.72'N 36°30.47'N	25°27.81'E 25°27.66'E	121 121
POS510/47	47/GC	Gravity Core	18.03.17	07:26 07:40	36°35.15'N	25°23.30'E	361
POS510/48	48/GC	Gravity Core	18.03.17	08:24 08:37	36°35.33'N	25°22.61'E	326
POS510/49	49/GC	Gravity Core	18.03.17	08:59 09:12	36°34.98'N	25°22.53'E	320
POS510/50	50/GC	Gravity Core	18.03.17	10:35 10:50	36°33.80'N	25°21.98'E	303
POS510/51-1	51/GC	Gravity Core	18.03.17	11:26 11:43	36°32.63'N	25°24.73'E	382
POS510/51-2	51/GC	Gravity Core	18.03.17	11:46 12:06	36°32.63'N	25°24.73'E	382
POS510/51-3	51/GC	Gravity Core	18.03.17	12:20 12:36	36°32.64'N	25°24.75'E	382
POS510/52-1	52/GC	Gravity Core	18.03.17	13:01 13:20	36°32.04'N	25°24.76'E	294
POS510/52-2	52/GC	Gravity Core	18.03.17	13:22 13:39	36°22.03'N	25°24.76'E	296
POS510/53	53/AUV	AUV	18.03.17 19:03.17	14:43 06:09	36°30.72'N 36°30.88'N	25°27.84'E 25°28.59'E	119 121
POS510/54-1	54/GC	Gravity Core	19.03.17	08:34 08:55	36°32.00'N	25°45.02'E	649
POS510/54-2	54/GC	Gravity Core	19.03.17	08:57 09:18	36°32.01'N	25°44.99'E	650
POS510/55	55/GC	Gravity Core	19.03.17	10:29 10:56	36°36.01'N	25°46.47'E	696
POS510/56	56/GC	Gravity Core	19.03.17	12:17 12:37	36°42.02'N	25°47.99'E	437
POS510/57	57/HF	Heatflow	19.03.17	12:59 13:36	36°42.00'N 36°42.02'N	25°48.01'E 25°47.98'E	435 437
POS510/58	58/HF	Heatflow	19.03.17	14:26 15:09	36°38.24'N 36°38.24'N	25°48.27'E 25°48.19'E	704 706
POS510/59	59/GC	Gravity Core	20.03.17	06:04 06:17	36°30.59'N	25°26.53'E	364
POS510/60	60/GC	Gravity Core	20.03.17	06:44 06:55	36°30.29'N	25°26.87'E	343
POS510/61	61/GC	Gravity Core	20.03.17	07:26 07:38	36°30.10'N	25°26.77'E	346
POS510/62	62/GC	Gravity Core	20.03.17	08:10 08:18	36°30.62'N	25°27.42'E	185

Ship's Log POSEIDON	Sample Number	Gear	Date	Time	Latitude	Longitude	Depth (m)
POS510/63	63/GC	Gravity Core	20.03.17	08:41 08:52	36°29.85'N	25°27.33'E	291
POS510/64	64/GC	Gravity Core	20.03.17	09:12 09:22	36°29.75'N	25°27.14'E	294
POS510/65	65/GC	Gravity Core	20.03.17	10:31 10:44	36°29.47'N	25°26.49'E	282
POS510/66	66/GC	Gravity Core	20.03.17	11:06 11:18	36°29.24'N	25°26.51'E	258
POS510/67	67/GC	Gravity Core	20.03.17	11:39 11:50	36°29.06'N	25°26.86'E	248
POS510/68	68/GC	Gravity Core	20.03.17	12:27 12:44	36°31.66'N	25°29.29'E	479
POS510/69	69/GC	Gravity Core	20.03.17	12:56 13:15	36°31.64'N	25°29.18'E	484
POS510/70	70/GC	Gravity Core	20.03.17	13:29 13:50	36°31.58'N	25°29.20'E	493
POS510/71	71/AUV	AUV	20.03.17 21.03.17	14:29 06:07	36°30.74'N 36°31.97'N	25°27.82'E 25°29.01'E	122 131
POS510/72	72/HF	Heatflow	21.03.17	08:09 08:48	36°28.01'N 36°28.00'N	25°45.01'E 25°45.07'E	605 606
POS510/73-1	73-1/HF	Heatflow	21.03.17	10:15 11:19	36°25.00'N 36°25.02'N	25°41.69'E 25°41.69'E	557 558
POS510/73-2	73-2/GC	Gravity Core	21.03.17	11:22 11:45	36°25.02'N	25°41.69'E	557
POS510/74	74/GC	Gravity Core	21.03.17	12:34 12:54	36°28.00'N	25°45.04'E	605
POS510/75	75/AUV	AUV	21.03.17 22.03.17	15:23 06:11	36°36.54'N 36°41.83'N	25°43.04'E 25°46.45'E	158 158
POS510/76	76/GC	Gravity Core	22.03.17	07:36 07:52	36°39.73'N	25°36.84'E	440
POS510/77-1	77-1/GC	Gravity Core	22.03.17	08:28 08:44	36°38.20'N	25°35.09'E	444
POS510/77-2	77-2/GC	Gravity Core	22.03.17	08:47 09:02	36°38.20'N	25°35.12'E	445
POS510/78	78/GC	Gravity Core	22.03.17	10:15 10:34	36°37.40'N	25°34.71'E	414
POS510/79-1	79-1/GC	Gravity Core	22.03.17	11:09 11:33	36°36.67'N	25°33.42'E	355
POS510/79-2	79-2/GC	Gravity Core	22.03.17	11:37 11:55	36°36.65'N	25°33.42'E	354
POS510/80	80/GC	Gravity Core	22.03.17	12:20 12:36	36°36.04'N	25°33.81'E	293
POS510/81	81/HF	Heatflow	22.03.17	13:08 14:09	36°37.40'N 36°37.42'N	25°34.68'E 25°34.69'E	412 408
POS510/82	82/AUV	AUV	22.03.17 23.03.17	15:27 06:10	36°30.73'N 36°31.23'N	25°27.82'E 25°28.75'E	122 177

Ship's Log POSEIDON	Sample Number	Gear	Date	Time	Latitude	Longitude	Depth (m)
POS510/83	83/HF	Heatflow	23.03.17	06:56 07:29	36°30.58'N 36°30.59'N	25°26.52'E 25°26.58'E	365 363
POS510/84	84/HF	Heatflow	23.03.17	07:49 08:20	36°29.85'N 36°29.87'N	25°27.37'E 25°27.36'E	292 292
POS510/85	85/HF	Heatflow	23.03.17	08:48 14:05	36°31.66'N 36°31.48'N	25°29.28'E 25°29.06'E	474 490
POS510/86	86/AUV	AUV	23.03.17 24.03.17	15:24 06:14	36°30.73'N 36°30.11'N	25°27.82'E 25°27.71'E	121 120
POS510/87	87/GC	Gravity Core	24.03.17	06:58 07:15	36°31.48'N	25°29.35'E	489
POS510/88-1	88-1/GC	Gravity Core	24.03.17	07:36 07:53	36°31.30'N	25°29.31'E	489
POS510/88-2	88-2/GC	Gravity Core	24.03.17	07:59 08:19	36°31.30'N	25°29.31'E	488
POS510/89-1	89-1/GC	Gravity Core	24.03.17	08:31 08:51	36°31.30'N	25°29.20'E	491
POS510/89-2	89-2/GC	Gravity Core	24.03.17	08:57 09:13	36°31.30'N	25°29.21'E	487
POS510/90-1	90-1/GC	Gravity Core	24.03.17	10:30 10:52	36°31.31'N	25°29.08'E	486
POS510/90-2	90-2/GC	Gravity Core	24.03.17	10:54 11:13	36°31.32'N	25°29.07'E	487
POS510/90-3	90-3/GC	Gravity Core	24.03.17	11:25 11:41	36°31.32'N	25°29.09'E	486
POS510/91	91/GC	Gravity Core	24.03.17	12:01 12:17	36°31.51'N	25°29.08'E	490
POS510/92	92/GC	Gravity Core	24.03.17	12:51 13:12	36°31.60'N	25°29.21'E	489
POS510/93-1	93-1/GC	Gravity Core	24.03.17	13:40 13:56	36°31.64'N	25°29.23'E	480
POS510/93-2	93-2/GC	Gravity Core	24.03.17	14:01 14:19	36°31.64'N	25°29.21'E	484
POS510/94	94/AUV	AUV	24.03.17 25.03.17	15:06 06:09	36°30.75'N 36°30.60'N	25°27.81'E 25°27.91'E	127 130
POS510/95	95/GC	Gravity Core	25.03.17	07:49 07:57	36°24.71'N	25°21.68'E	228
POS510/96-1	96-1/GC	Gravity Core	25.03.17	08:18 08:32	36°24.42'N	25°21.65'E	307
POS510/96-2	96-2/GC	Gravity Core	25.03.17	08:44 08:57	36°24.43'N	25°21.64'E	273
POS510/97	97/GC	Gravity Core	25.03.17	09:14 09:23	36°24.58'N	25°21.66'E	237
POS510/98	98/GC	Gravity Core	25.03.17	10:29 10:44	36°24.27'N	25°21.61'E	313
POS510/99	99-1/GC	Gravity Core	25.03.17	11:26 11:34	36°23.24'N	25°22.12'E	218

Ship's Log POSEIDON	Sample Number	Gear	Date	Time	Latitude	Longitude	Depth (m)
POS510/99	99-2/GC	Gravity Core	25.03.17	11:35 11:50	36°23.24'N	25°22.12'E	211
POS510/100	100/GC	Gravity Core	25.03.17	12:12 12:23	36°23.10'N	25°22.08'E	262
POS510/101	101/GC	Gravity Core	25.03.17	12:39 12:51	36°23.14'N	25°22.06'E	241
POS510/102	102/GC	Gravity Core	25.03.17	13:57 14:07	36°23.14'N	25°22.05'E	235
POS510/103	103/AUV	AUV	25.03.17 26.03.17	16:01 07:25	36°27.17'N 36°25.95'N	25°24.76'E 25°24.08'E	151 208
POS510/104	104/HF	Heatflow	26.03.17	08:10 13:01	36°24.72'N 36°23.18'N	25°21.67'E 25°22.13'E	224 284
POS510/105	105/AUV	AUV	26.03.17 27.03.17	14:26 05:04	36°24.34'N 36°25.66'N	25°22.38'E 25°23.03'E	158 375
POS510/106	106/GC	Gravity Core	27.03.17	06:01 06:09	36°27.00'N	25°24.76'E	207
POS510/107	107/GC	Gravity Core	27.03.17	06:22	36°26.75'N	25°24.69'E	299
POS510/108	108-1/GC	Gravity Core	27.03.17	06:48 07:01	36°26.76'N	25°24.45'E	323
POS510/108	108-2/GC	Gravity Core	27.03.17	07:03 07:14	36°26.75'N	25°24.45'E	327
POS510/109	109/GC	Gravity Core	27.03.17	07:33 07:47	36°26.40'N	25°23.68'E	376
POS510/110	110/GC	Gravity Core	27.03.17	08:08 08:20	36°26.70'N	25°23.21'E	377
POS510/111	111/GC	Gravity Core	27.03.17	10:17 10:36	36°15.59'N	25°18.70'E	391
POS510/112	112/GC	Gravity Core	27.03.17	11:16 11:30	36°15.31'N	25°18.97'E	343
POS510/113	113/GC	Gravity Core	27.03.17	12:28 13:00	36°14.43'N	25°17.19'E	439

Note: Several repeated stations recorded in the ship's log were inadvertently reported in the science station list with the following numbers:

POS510/06 (07/GC, repeat of 06/GC), POS510/07 (08/GC), POS510/08 (09/GC), POS510/09 (10/AUV), POS510/10 (11/HF), POS510/11 (12/AUV), POS510/12 (13/GC), POS510/13 (14/GC and 15/GC, repeat of 14/GC), POS510/14 (16/GC), POS510/15 (17/GC), POS510/16 (16/GC-B), POS510/17 (17/GC-B).

Appendix 2: AUV Abyss Sensor Description

CTD:

Vendor	Seabird
Typ	SBE 49 FastCAT
Serial number	4955482-0168
Last calibration	28.01.2016
Exported data contains	latitude, longitude, mission_time, depth, conductivity, temperature, salinity, sound_speed
Unit	[deg],[deg],[HH.MM.SS.F],[m],[S/m],[°C],[psu],[m/s]
Sample rate	4Hz

ECO (Combination Fluorometer and Turbidity Sensor:

Vendor	Wetlabs
Typ	FLNTU /
Serial number	FLNTURTD-939
Last calibration	-
Exported data contains	latitude, longitude, mission_time, depth, version, chl_ref(lambda), chl_sig, chlorophyll_a, turbidity_ref, turbidity_raw, turbidity
Unit	[deg],[deg],[HH.MM.SS.F],[m],[],[nm],[count],[µg/l],[nm],[count],[NTU]
Sample rate	1Hz

REDOX:

Vendor	Advanced Industrial Science and Technology (AIST) / Ko.Ichi NAKAMURA
Typ	EH-Sensor
Serial number	-
Last calibration	-
Exported data contains	latitude, longitude, mission_time, depth, REDOX,
Unit	[deg],[deg],[HH.MM.SS.F],[m],[mV]
Sample rate	1Hz

Magnetometer / Self Potentential:

Magnetometer

Vendor	Applied Physics Systems
Typ	1540
Serial number	0685
Last calibration	-
Exported data contains	Time, X, Y ,Z, Temp
Unit	[sec s. 1.1.1970],[Gauss],[Gauss],[Gauss],[°C]
Sample rate	1Hz

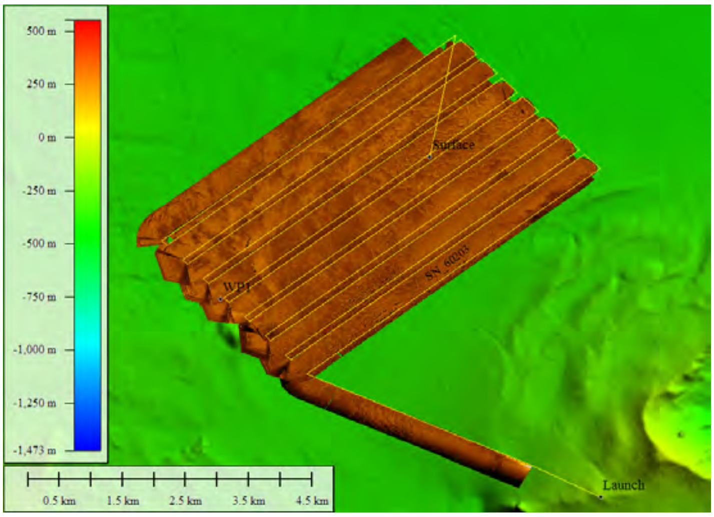
Self Potential Electrode

Vendor	Silvion
Typ	TYPE CCS1 – PORT PORTABLE SEAWATER REFERENCE ELECTRODE

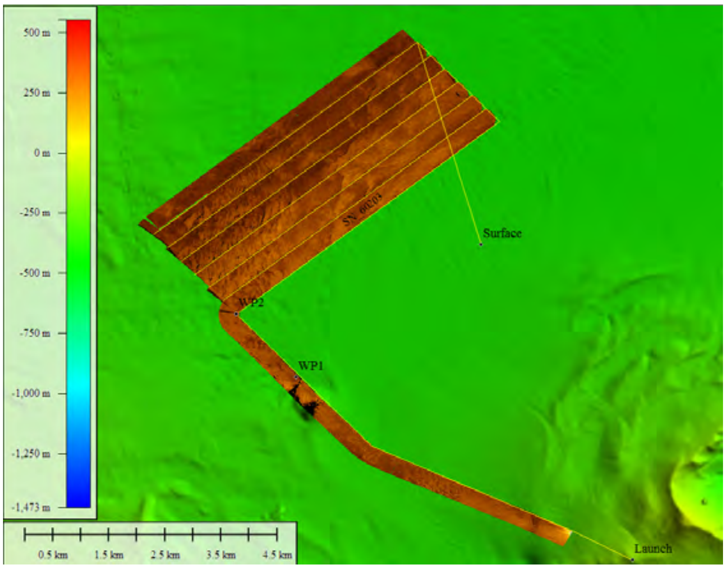
Datalogger Magnetometer / Selfpotential

Vendor	Magson
Typ	CSEM / Selfpotential Logger
Serial number	122
Last calibration	-
Exported data contains	Time, E-Field1, E-Field2, E-Field3,Magnetometer,
Unit	[sec s. 1.1.1970],[µV],[µV],[µV],[see Magnetometer Table]
Sample rate	1Hz
Notes	Data output is binary and has to be converted to the desired files

Appendix 3: AUV Abyss Dive Protocols

Station	**02**	Day (UTC)	09.03.2017
Dive	**Abyss0257**		
 		Mission goal:	Sidescan-Mapping north/west of Kolumbo (Anydros Basin)
		Times (UTC)	
		Launch	14:25
		Mission start	14:29
		Survey start	15:15
		Survey finished	05:16
		Mission finished	05:44
		Recovery	06:15
		Distance travelled	84,66 km
		Mission comments	- No Transponders (Bottom-Lock at surface) - Bottom following
Depth / Altitude	- the vehicle dived on a fix altitude of 40 m - survey depths between 300 - 375		
Line spacing	- line spacing: 300/100 m		
Sensor	Edgetech 2200-M Sidescan 120kHz		
Total raw files	91 files (.jsf) / 5,35GB	First file	DATA0000004.jsf
		Last file:	DATA0000094.jsf
Survey area covered:	Average coverage:		
Sensor	Magnetometer (APS-1540 S/N 0685) / Self Potential Sensor		
Total raw files	185 files (.B122) / 10.24 GB	First file	170309143000.B122
		Last file:	170310055000.B122
Comments	- Combined binary files include Magnetometer and Self Potential data - Sensor data positions are not shifted to the corrected vehicle track		
Sensor	SeaBird SBE49 FastCAT CTD (S/N: 4948793-0168)		
Total raw files	1 file (.txt) / 22.6 MB	File name	Abyss0257_CTD.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Wetlabs ECO FLNTU (Chlorophyll / Turbidity) (S/N: FLNTURTD-939)		
Total raw files	1 file (.txt) / 5.9 MB	File name	Abyss0257_ECO.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor			
Total raw files		File name	
Comments			
Comments	- EH-Cable has a broken cable – no datapoints		

Station	**10**	Day (UTC)	10.03.2017
Dive	**Abyss0258**		



Mission goal:

Continues sidescan-mapping of dive 267 in the Anydros Basin

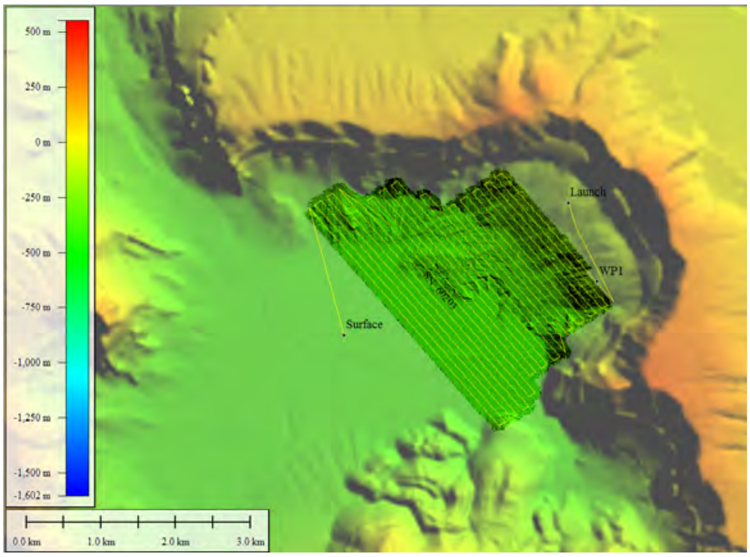
Times (UTC)	
Launch	14:54
Mission start	14:56
Survey start	16:13
Survey finished	04:19
Mission finished	05:04
Recovery	06:04
Distance travelled	78.37 km

Mission comments

- No Transponders (Bottom-Lock at surface)
- Same launch position than dive 257
- Reduce the SSS-Range to 300m instead of 400m

Depth / Altitude	- the vehicle dived on a fix altitude of 40 m - survey depths between 310 - 380		
Line spacing	- line spacing: 300m		
Sensor	Edgetech 2200-M Sidescan 120kHz		
Total raw files	80 files (.jsf) / 4,65 GB	First file	DATA0000094.jsf
Used raw files		Last file:	DATA0000176.jsf
Survey area covered:		Average coverage:	
Sensor	Magnetometer (APS-1540 S/N 0685) / Self Potential Sensor		
Total raw files	177 files (.B122) / 7,93 GB	First file	170310145000.B122
		Last file:	170311053000.B122
Comments	- Combined binary files include Magnetometer and Self Potential data - Sensor data positions are not shifted to the corrected vehicle track		
Sensor	SeaBird SBE49 FastCAT CTD (S/N: 4948793-0168)		
Total raw files	1 file (.txt) / 20,9 MB	File name	Abyss0258_CTD.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Wetlabs ECO FLNTU (Chlorophyll / Turbidity) (S/N: FLNTURTD-939)		
Total raw files	1 file (.txt) / 5.5 MB	File name	Abyss0258_ECO.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Comments	- Sensor data positions are not shifted to the corrected vehicle track		

Station	12	Day (UTC)	11.03.2017
Dive	**Abyss0259**		



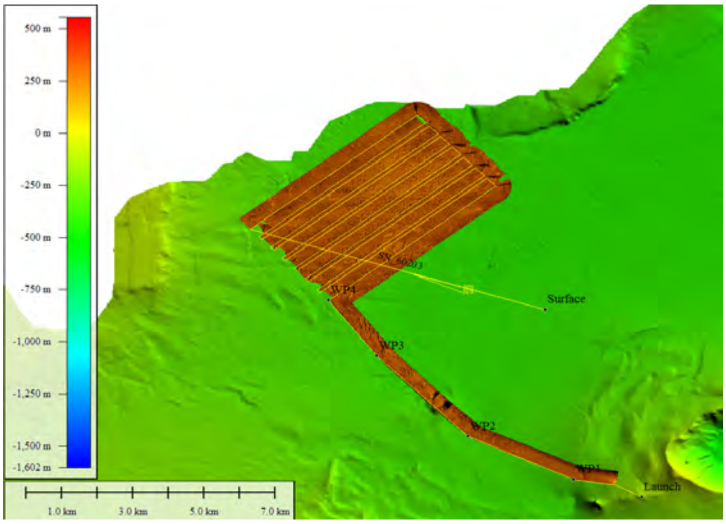
Mission goal:	
Mission 259 was to map the north/eastern part of the caldera of Santorini	

Times (UTC)	
Launch	16:49
Mission start	16:56
Survey start	17:10
Survey finished	05:29
Mission finished	05:53
Recovery	06:15
Distance travelled	71.79 km
Mission comments	

- No Transponders (Bottom-Lock at surface)
- Bottom following

Depth / Altitude	- the vehicle dived on a fix altitude of 40 m - survey depths between 125 and 350 meters			
Line spacing	- line spacing: 80 m			
Sensor	RESON Seabat 7125 200 kHz Multibeam			
Total raw files	50 files (.s7k) / 13.61 GB		First file	20170311_165900.s7k
Used raw files			Last file:	20170312_051441.s7k
Survey area covered:		Average coverage:		
Sensor	Magnetometer (APS-1540 S/N 0685) / Self Potential Sensor			
Total raw files	160 files (.B122) / 7.2 GB		First file	170311164500.B122
			Last file:	170312060000.B122
Comments	- Combined binary files include Magnetometer and Self Potential data - Sensor data positions are not shifted to the corrected vehicle track			
Sensor	Eh / REDOX sensor (Koichi Nakamura)			
Total raw files	1 file (.txt) / 3.1 MB		File name	Abyss0259_REDOX.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track			
Sensor	SeaBird SBE49 FastCAT CTD (S/N: 4948793-0168)			
Total raw files	1 file (.txt) / 19.2 MB		File name	Abyss0259_CTD.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track			
Sensor	Wetlabs ECO FLNTU (Chlorophyll / Turbidity) (S/N: FLNTURTD-939)			
Total raw files	1 file (.txt) / 5 MB		File name	Abyss0259_ECO.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track			
Comments	- Sensor data positions are not shifted to the corrected vehicle track			

Station	**25**	Day (UTC)	13.03.2017
Dive	**Abyss0260**		



Mission goal:

Continues sidescan-mapping of dive 257 & 258 in the Anydros Basin

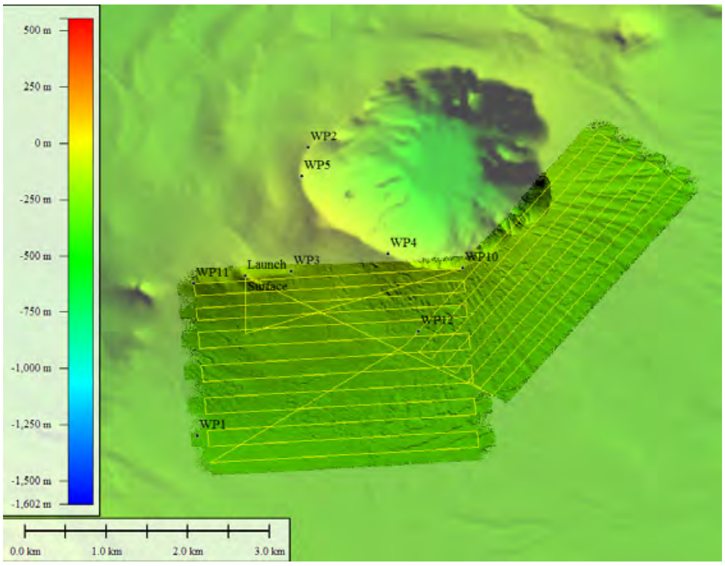
Times (UTC)	
Launch	15:15
Mission start	15:18
Survey start	17:00
Survey finished	06:15
Mission finished	07:09
Recovery	07:50
Distance travelled	87.39 km

Mission comments

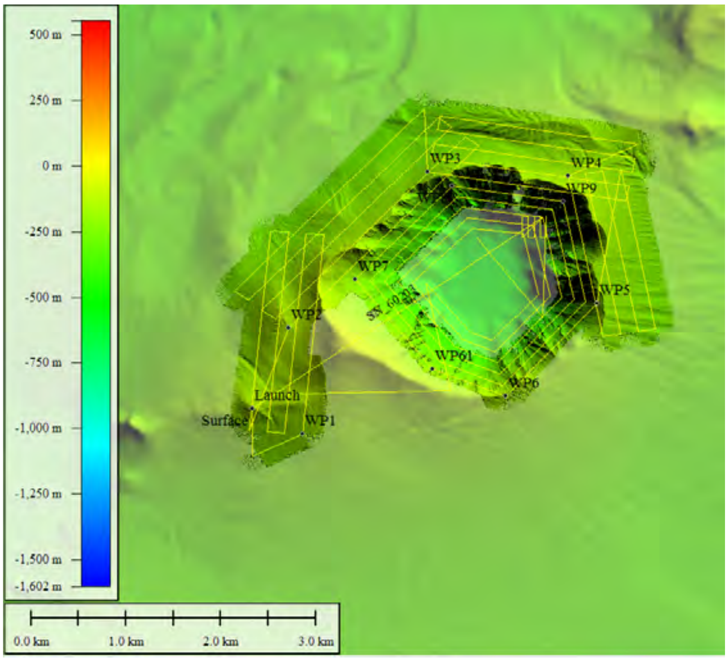
- No Transponders (Bottom-Lock at surface)
- Same launch position than dive 257
- Bottom following

Depth / Altitude	- the vehicle dived on a fix altitude of 40 m - survey depths between 250 - 375		
Line spacing	- line spacing: 300/100m		
Sensor	Edgetech 2200-M Sidescan 120kHz		
Total raw files	91 files (.jsf) / 5.48 GB	First file	DATA0000184.jsf
Used raw files		Last file:	DATA0000274.jsf
Survey area covered:	Average coverage:		
Sensor	Magnetometer (APS-1540 S/N 0685) / Self Potential Sensor		
Total raw files	205 files (.B122) / 9.15 GB	First file	170313145500.B122
		Last file:	170314075000.B122
Comments	- Combined binary files include Magnetometer and Self Potential data - Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Eh / REDOX sensor (Koichi Nakamura)		
Total raw files	1 file (.txt) / 3.9 MB	File name	Abyss0260_REDOX.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	SeaBird SBE49 FastCAT CTD (S/N: 4948793-0168)		
Total raw files	1 file (.txt) / 23.5 MB	File name	Abyss0260_CTD.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Wetlabs ECO FLNTU (Chlorophyll / Turbidity) (S/N: FLNTURTD-939)		
Total raw files	1 file (.txt) / 6.1 MB	File name	Abyss0260_ECO.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Comments	- Sensor data positions are not shifted to the corrected vehicle track		

Station	30	Day (UTC)	14.03.2017
Dive	Abyss0261		
Mission goal:	Mission 261 was to map the south/east of Kolumbo		
Times (UTC)			
Launch	16:36		
Mission start	16:45		
Survey start	16:52		
Survey finished	05:07		
Mission finished	05:39		
Recovery	06:13		
Distance travelled	71.66 km		
Mission comments	- No Transponders (Bottom-Lock at surface) - Bottom following		
Depth / Altitude	- the vehicle dived on a fix altitude of 80 m - survey depths between 50 and 250 meters		
Line spacing	- line spacing: 150 m		
Sensor	RESON Seabat 7125 200 kHz Multibeam		
Total raw files	54 files (.s7k) / 14.12 GB	First file	20170314_165207.s7k
Used raw files	53 files (.s7k) / 14.11 GB	Last file:	20170315_050656.s7k
Survey area covered:		Average coverage:	
Sensor	Magnetometer (APS-1540 S/N 0685) / Self Potential Sensor		
Total raw files	185 files (.B122) / 9.19 GB	First file	170314145554.B122
		Last file:	170315060500.B122
Comments	- Combined binary files include Magnetometer and Self Potential data - Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Eh / REDOX sensor (Koichi Nakamura)		
Total raw files	1 file (.txt) / 3.1 MB	File name	Abyss0261_REDOX.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	SeaBird SBE49 FastCAT CTD (S/N: 4948793-0168)		
Total raw files	1 file (.txt) / 19.1 MB	File name	Abyss0261_CTD.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Wetlabs ECO FLNTU (Chlorophyll / Turbidity) (S/N: FLNTURTD-939)		
Total raw files	1 file (.txt) / 5.0 MB	File name	Abyss0261_ECO.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Comments	- Sensor data positions (except RESON Multibeam) are not shifted to the corrected vehicle track		



Station	**35**	Day (UTC)	16.03.2017
Dive	**Abyss0262**	GEOMAR	

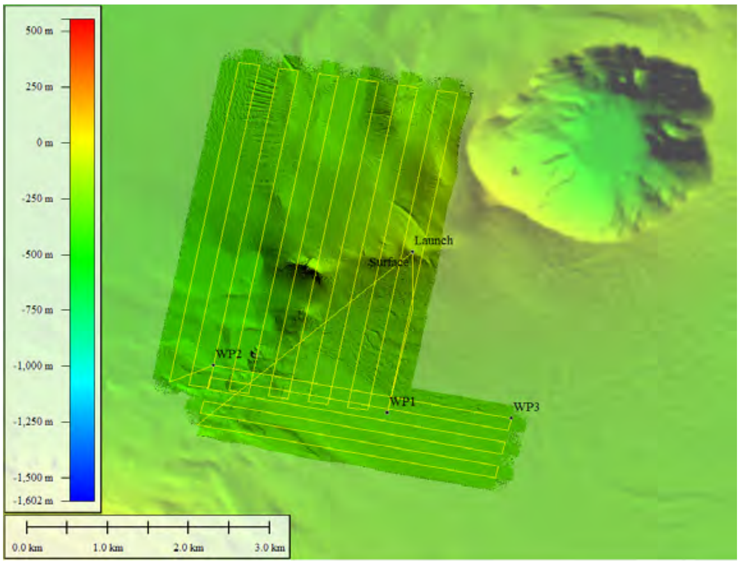


Mission goal:	
Mission 262 was to map parts inside the caldera of Colombo	
Times (UTC)	
Launch	14:58
Mission start	15:02
Survey start	15:09
Survey finished	02:12
Mission finished	02:12
Recovery	03:51
Distance travelled	66.03 km
Mission comments	

- No Transponders (Bottom-Lock at surface)
- Bottom following

Depth / Altitude	- the vehicle dived on a fix altitude of 80 m - survey depths between 50 and 250 meters		
Line spacing	- line spacing: 100 m		
Sensor	RESON Seabat 7125 200 kHz Multibeam		
Total raw files	51 files (.s7k) / 12.65 GB	First file	20170316_140239.s7k
Used raw files	50 files (.s7k) / 12.63 GB	Last file:	20170317_030014.s7k
Survey area covered:	Average coverage:		
Sensor	Magnetometer (APS-1540 S/N 0685) / Self Potential Sensor		
Total raw files	149 files (.B122) / 6.68 GB	First file	170316145046.B122
		Last file:	170317031000.B122
Comments	- Combined binary files include Magnetometer and Self Potential data - Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Eh / REDOX sensor (Koichi Nakamura)		
Total raw files	1 file (.txt) / 3.0 MB	File name	Abyss0262_REDOX.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	SeaBird SBE49 FastCAT CTD (S/N: 4948793-0168)		
Total raw files	1 file (.txt) / 18.1 MB	File name	Abyss0262_CTD.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Wetlabs ECO FLNTU (Chlorophyll / Turbidity) (S/N: FLNTURTD-939)		
Total raw files	1 file (.txt) / 4.7 MB	File name	Abyss0262_ECO.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Comments	- Sensor data positions (except RESON Multibeam) are not shifted to the corrected vehicle track - Mission were canceled after a wall-contact inside the caldera		

Station	46		Day (UTC)	17.03.2017
Dive	Abyss0263			



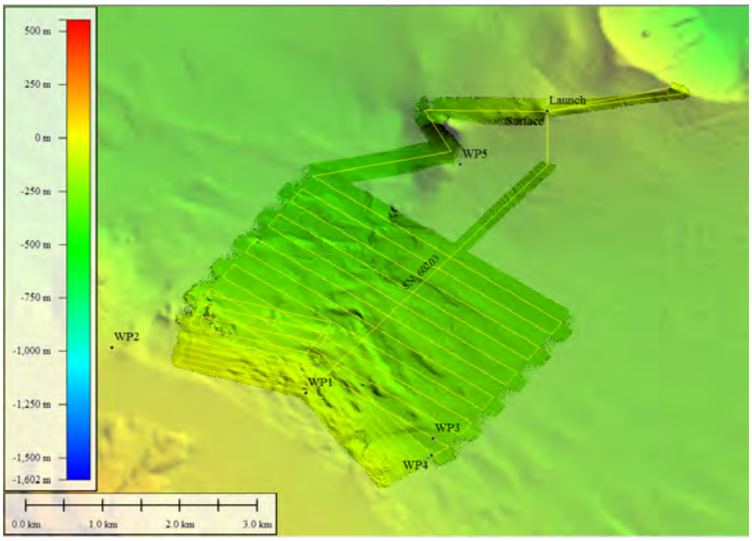
Mission goal:

Mission 263 was to map the south/east of Colombo

Times (UTC)	
Launch	15:33
Mission start	15:36
Survey start	15:43
Survey finished	04:35
Mission finished	05:09
Recovery	06:11
Distance travelled	75.19 km
Mission comments	

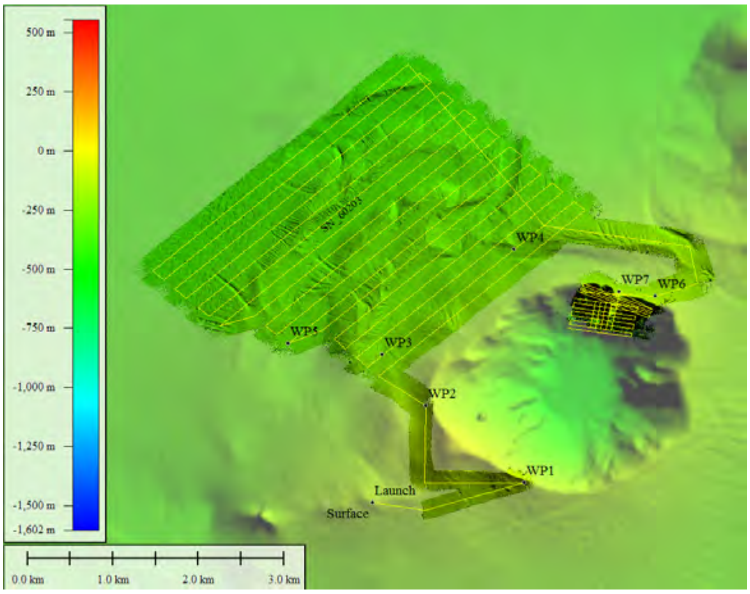
- No Transponders (Bottom-Lock at surface)
- Same launch position than dive 257
- Bottom following

Depth / Altitude	- the vehicle dived on a fix altitude of 80 m - survey depths between 50 and 300 meters			
Line spacing	- line spacing: 200 m			
Sensor	RESON Seabat 7125 200 kHz Multibeam			
Total raw files	59 files (.s7k) / 14.92 GB		First file	20170317_144608.s7k
Used raw files			Last file:	20170318_043450.s7k
Survey area covered:		Average coverage:		
Sensor	Magnetometer (APS-1540 S/N 0685) / Self Potential Sensor			
Total raw files	167 files (.B122) / 7.42 GB		First file	170317152613.B122
			Last file:	170318051000.B122
Comments	- Combined binary files include Magnetometer and Self Potential data - Sensor data positions are not shifted to the corrected vehicle track			
Sensor	Eh / REDOX sensor (Koichi Nakamura)			
Total raw files	1 file (.txt) / 3.3 MB		File name	Abyss0263_REDOX.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track			
Sensor	SeaBird SBE49 FastCAT CTD (S/N: 4948793-0168)			
Total raw files	1 file (.txt) / 20.1 MB		File name	Abyss0263_CTD.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track			
Sensor	Wetlabs ECO FLNTU (Chlorophyll / Turbidity) (S/N: FLNTURTD-939)			
Total raw files	1 file (.txt) / 5.2 MB		File name	Abyss0263_ECO.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track			
Comments	- Sensor data positions (except RESON Multibeam) are not shifted to the corrected vehicle track			

Station	**53**	Day (UTC)	18.03.2017
Dive	**Abyss0264**		
		Mission goal:	
		Mission 264 was to map the area between Santorini and Colombo	
		Times (UTC)	
		Launch	14:43
		Mission start	14:46
		Survey start	14:54
		Survey finished	04:22
		Mission finished	04:38
		Recovery	06:08
		Distance travelled	76.96 km
		Mission comments	
		- No Transponders (Bottom-Lock at surface) - Same launch position than dive 257 - Bottom following	
Depth / Altitude	- the vehicle dived on a fix altitude of 40 m and 80m - survey depths between 20 and 275 meters		
Line spacing	- line spacing: 80 m and 150		
Sensor	RESON Seabat 7125 200 kHz Multibeam		
Total raw files	67 files (.s7k) / 17.17 GB	First file	20170318_143830.s7k
Used raw files		Last file:	20170319_041931.s7k
Survey area covered:	Average coverage:		
Sensor	Magnetometer (APS-1540 S/N 0685) / Self Potential Sensor		
Total raw files	189 files (.B122) / 8.39 GB	First file	170318143620.B122
		Last file:	170319060500.B122
Comments	- Combined binary files include Magnetometer and Self Potential data - Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Eh / REDOX sensor (Koichi Nakamura)		
Total raw files	1 file (.txt) / 3.4 MB	File name	Abyss0264_REDOX.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	SeaBird SBE49 FastCAT CTD (S/N: 4948793-0168)		
Total raw files	1 file (.txt) / 20.6 MB	File name	Abyss0264_CTD.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Wetlabs ECO FLNTU (Chlorophyll / Turbidity) (S/N: FLNTURTD-939)		
Total raw files	1 file (.txt) / 5.3 MB	File name	Abyss0264_ECO.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Comments	- Sensor data positions (except RESON Multibeam) are not shifted to the corrected vehicle track		

Station	**71**	Day (UTC)	20.03.2017
Dive	**Abyss0265**		

GEOMAR

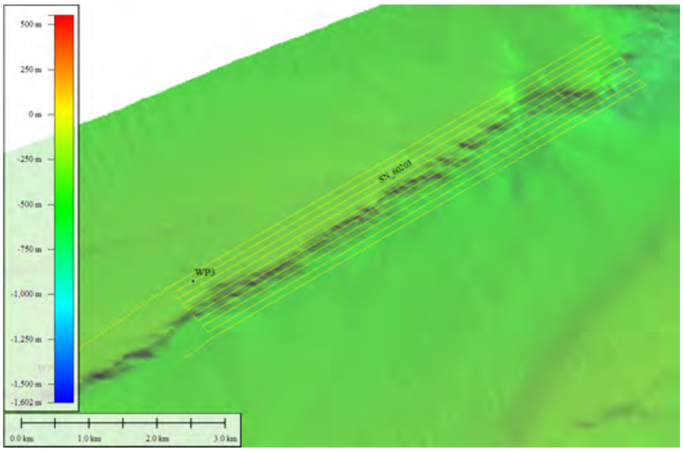


Mission goal:	
Mission 250 was to map the north/western part and parts	
Times (UTC)	
Launch	14:30
Mission start	14:33
Survey start	14:39
Survey finished	04:19
Mission finished	04:22
Recovery	06:12
Distance travelled	76.76 km
Mission comments	

- No Transponders (Bottom-Lock at surface)
- Same launch position than dive 257
- Bottom following

Depth / Altitude	- the vehicle dived on a fix altitude of 80 m - survey depths between 30 and 300 meters		
Line spacing	- line spacing: 80 m		
Sensor	RESON Seabat 7125 200 kHz Multibeam		
Total raw files	57 files (.s7k) / 15 GB	First file	20170320_143936.s7k
Used raw files		Last file:	20170321_041622.s7k
Survey area covered:	Average coverage:		
Sensor	Magnetometer (APS-1540 S/N 0685) / Self Potential Sensor		
Total raw files	237 files (.B122) / 9.69 GB	First file	170320090938.B122
		Last file:	170321072000.B122
Comments	- Combined binary files include Magnetometer and Self Potential data - Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Eh / REDOX sensor (Koichi Nakamura)		
Total raw files	1 file (.txt) / 3.2 MB	File name	Abyss0265_REDOX.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	SeaBird SBE49 FastCAT CTD (S/N: 4948793-0168)		
Total raw files	1 file (.txt) / 19.5 MB	File name	Abyss0265_CTD.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Wetlabs ECO FLNTU (Chlorophyll / Turbidity) (S/N: FLNTURTD-939)		
Total raw files	1 file (.txt) / 5.08 MB	File name	Abyss0265_ECO.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Comments	- Sensor data positions (except RESON Multibeam) are not shifted to the corrected vehicle track		

Station	**75**	Day (UTC)	21.03.2017
Dive	**Abyss0266**		

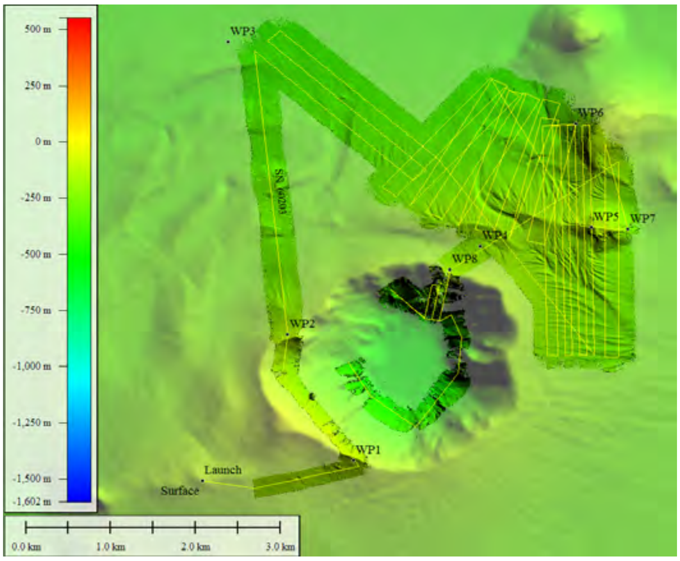


Mission goal:
Mission 266 was to map the Amorgos fault

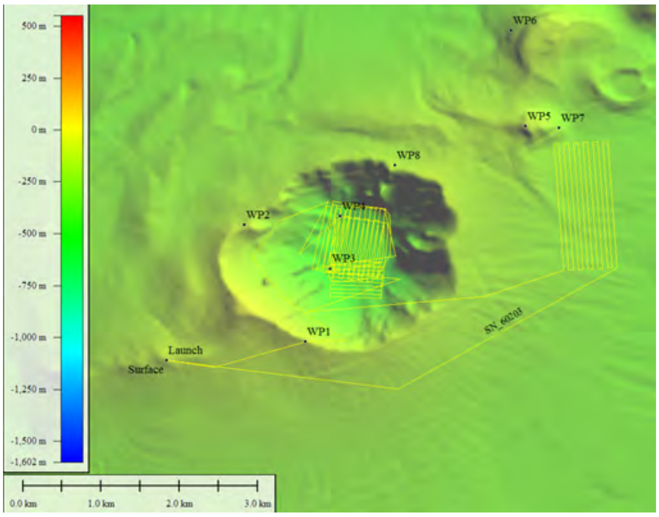
Times (UTC)	
Launch	15:23
Mission start	15:25
Survey start	15:29
Survey finished	05:25
Mission finished	05:36
Recovery	06:10
Distance travelled	78.51 km

Mission comments
- No Transponders (Bottom-Lock at surface)
- Bottom following

Depth / Altitude	- the vehicle dived on a fix altitude of 80 m - survey depths between 100 and 550 meters		
Line spacing	- line spacing: 100 m		
Sensor	RESON Seabat 7125 200 kHz Multibeam		
Total raw files	179 files (.s7k) / 44.3 GB	First file	20170321_144048.s7k
Used raw files		Last file:	20170322_052256.s7k
Survey area covered:	5.7 km^2	Average coverage:	
Sensor	Magnetometer (APS-1540 S/N 0685) / Self Potential Sensor		
Total raw files	199 files (.B122) / 8.04 GB	First file	170321151000.B122
		Last file:	170322073750.B122
Comments	- Combined binary files include Magnetometer and Self Potential data - Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Eh / REDOX sensor (Koichi Nakamura)		
Total raw files	1 file (.txt) / 3.28 MB	File name	Abyss0266_REDOX.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	SeaBird SBE49 FastCAT CTD (S/N: 4948793-0168)		
Total raw files	1 file (.txt) / 20 MB	File name	Abyss0266_CTD.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Wetlabs ECO FLNTU (Chlorophyll / Turbidity) (S/N: FLNTURTD-939)		
Total raw files	1 file (.txt) / 5.22 MB	File name	Abyss0266_ECO.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Comments	- Sensor data positions (except RESON Multibeam) are not shifted to the corrected vehicle track		

Station	**82**	Day (UTC)	22.03.2017
Dive	**Abyss0267**		
		Mission goal:	
		Mission 267 was to map the south/eastern and parts inside Colombo	
		Times (UTC)	
		Launch	15:28
		Mission start	15:30
		Survey start	15:37
		Survey finished	05:26
		Mission finished	05:32
		Recovery	06:11
		Distance travelled	78.28 km
		Mission comments	
		- No Transponders (Bottom-Lock at surface) - Bottom following	
Depth / Altitude	- the vehicle dived on a fix altitude of 80 m - survey depths between 20 and 325 meters		
Line spacing	- line spacing: 70 / 100 / 170 m (depends on the slope)		
Sensor	RESON Seabat 7125 200 kHz Multibeam		
Total raw files	57 files (.s7k) / 14.3 GB	First file	20170322_153734.s7k
Used raw files		Last file:	20170323_051204.s7k
Survey area covered:		Average coverage:	
Sensor	Magnetometer (APS-1540 S/N 0685) / Self Potential Sensor		
Total raw files	219 files (.B122) / 8.48 GB	First file	170322125021.B122
		Last file:	170323065500.B122
Comments	- Combined binary files include Magnetometer and Self Potential data - Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Eh / REDOX sensor (Koichi Nakamura)		
Total raw files	1 file (.txt) / 3.24 MB	File name	Abyss0267_REDOX.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	SeaBird SBE49 FastCAT CTD (S/N: 4948793-0168)		
Total raw files	1 file (.txt) / 19.8 MB	File name	Abyss0267_CTD.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Wetlabs ECO FLNTU (Chlorophyll / Turbidity) (S/N: FLNTURTD-939)		
Total raw files	1 file (.txt) / 5.15 MB	File name	Abyss0267_ECO.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Comments	- Sensor data positions (except RESON Multibeam) are not shifted to the corrected vehicle track - A small redox-anomaly at time 16:12		

Station	**86**	Day (UTC)	23.03.2017
Dive	**Abyss0268**		

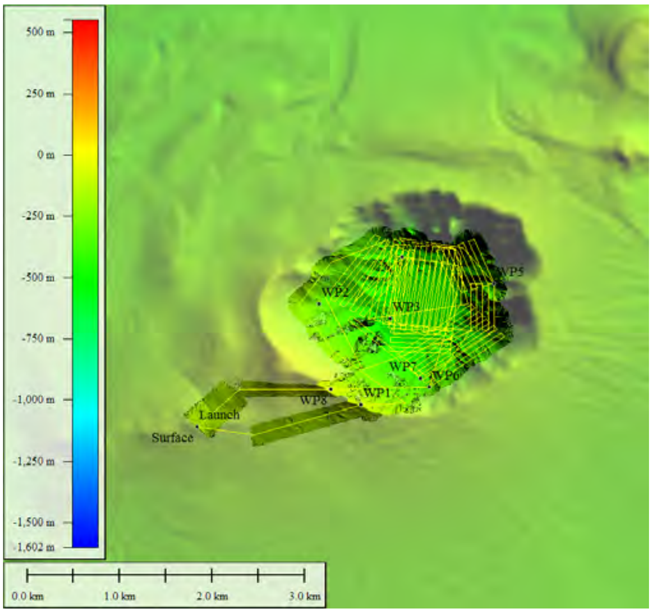


Mission goal:	
Mission 268 was to map the inside of the Kolumbos caldera	
Times (UTC)	
Launch	15:25
Mission start	15:28
Survey start	15:35
Survey finished	03:39
Mission finished	04:36
Recovery	06:14
Distance travelled	73.03 km
Mission comments	

- No Transponders (Bottom-Lock at surface)
- Bottom following
- MB 400 kHz

Depth / Altitude	- the vehicle dived on a fix altitude of 80 m - survey depths between 20 and 450 meters		
Line spacing	- line spacing: 50 m		
Sensor	RESON Seabat 7125 400 kHz Multibeam		
Total raw files	--	First file	--
Used raw files		Last file:	--
Survey area covered:	-- Average coverage:	--	
Sensor	Magnetometer (APS-1540 S/N 0685) / Self Potential Sensor		
Total raw files	218 files (.B122) / 8.45 GB	First file	170323125927.B122
		Last file:	170324072500.B122
Comments	- Combined binary files include Magnetometer and Self Potential data - Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Eh / REDOX sensor (Koichi Nakamura)		
Total raw files	1 file (.txt) / 3.04 MB	File name	Abyss0268_REDOX.txt
Comments	- Sensor was disabled because of error		
Sensor	SeaBird SBE49 FastCAT CTD (S/N: 4948793-0168)		
Total raw files	1 file (.txt) / 18.5 MB	File name	Abyss0268_CTD.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Wetlabs ECO FLNTU (Chlorophyll / Turbidity) (S/N: FLNTURTD-939)		
Total raw files	1 file (.txt) / 4.83 MB	File name	Abyss0268_ECO.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Comments	- Sensor data positions are not shifted to the corrected vehicle track - No Multibeam Data, because of a network communication problem, between MB and Vehicle		

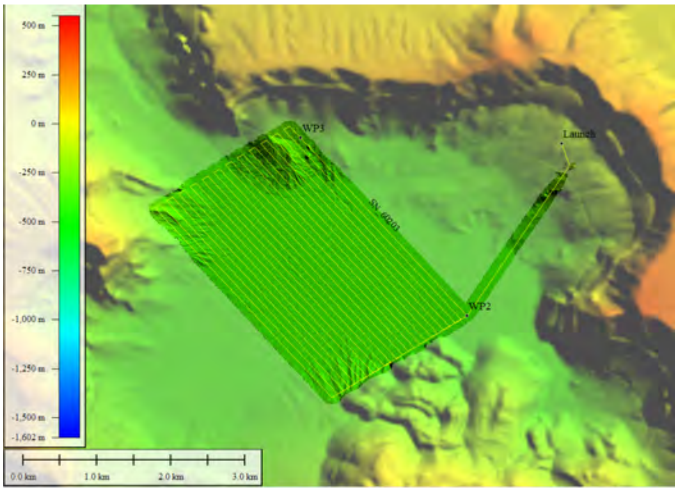
Station	**94**	Day (UTC)	24.03.2017
Dive	**Abyss0269**		



Mission goal:	Mission 269 was to map the inside of the Kolumbo caldera.
Times (UTC)	
Launch	15:06
Mission start	15:09
Survey start	15:16
Survey finished	04:38
Mission finished	05:02
Recovery	06:08
Distance travelled	77.07 km
Mission comments	- No Transponders (Bottom-Lock at surface) - Bottom following - MB 200 kHz

Depth / Altitude	- the vehicle dived on a fix altitude of 80 m - survey depths between 20 and 425meters		
Line spacing	- line spacing: 50 m		
Sensor	RESON Seabat 7125 200 kHz Multibeam		
Total raw files	53 files (.s7k) / 13.1 GB	First file	20170324_151612.s7k
Used raw files		Last file:	20170325_050033.s7k
Survey area covered:		Average coverage:	
Sensor	Magnetometer (APS-1540 S/N 0685) / Self Potential Sensor		
Total raw files	184 files (.B122) / 7.63 GB	First file	170324150000.B122
		Last file:	170325064345.B122
Comments	- Combined binary files include Magnetometer and Self Potential data - Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Eh / REDOX sensor (Koichi Nakamura)		
Total raw files	1 file (.txt) / 3.21 MB	File name	Abyss0269_REDOX.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	SeaBird SBE49 FastCAT CTD (S/N: 4948793-0168)		
Total raw files	1 file (.txt) / 19,5 MB	File name	Abyss0269_CTD.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Wetlabs ECO FLNTU (Chlorophyll / Turbidity) (S/N: FLNTURTD-939)		
Total raw files	1 file (.txt) / 5.11 MB	File name	Abyss0269_ECO.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Comments	- Sensor data positions (except RESON Multibeam) are not shifted to the corrected vehicle track		

Station	**103**	Day (UTC)	25.03.2017
Dive	**Abyss0270**		

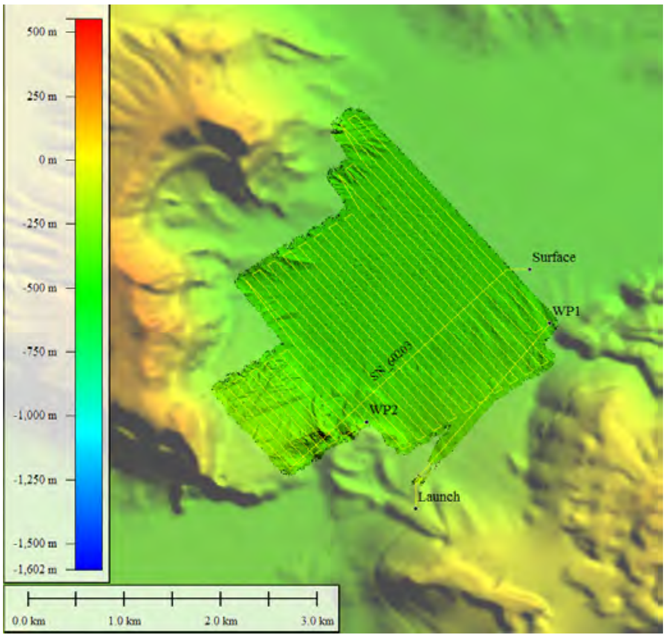


Mission goal:	
Mission 270 was to extend the map from the dive 259	
Times (UTC)	
Launch	16:02
Mission start	16:05
Survey start	16:07
Survey finished	07:05
Mission finished	07:11
Recovery	07:25
Distance travelled	83.87 km
Mission comments	

- No Transponders (Bottom-Lock at surface)
- Bottom following

Depth / Altitude	- the vehicle dived on a fix altitude of 40 m - survey depths between 250 and 350 meters		
Line spacing	- line spacing: 80 m		
Sensor	RESON Seabat 7125 200 kHz Multibeam		
Total raw files	87 files (.s7k) / 21.9 GB	First file	20170325_160743.s7k
Used raw files		Last file:	20170326_065337.s7k
Survey area covered:	Average coverage:		
Sensor	Magnetometer (APS-1540 S/N 0685) / Self Potential Sensor		
Total raw files	187 files (.B122) / 7.76 GB	First file	170325160000.B122
		Last file:	170326075740.B122
Comments	- Combined binary files include Magnetometer and Self Potential data - Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Eh / REDOX sensor (Koichi Nakamura)		
Total raw files	1 file (.txt) / 3.49 MB	File name	Abyss0270_REDOX.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	SeaBird SBE49 FastCAT CTD (S/N: 4948793-0168)		
Total raw files	1 file (.txt) / 21.3 MB	File name	Abyss0270_CTD.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Wetlabs ECO FLNTU (Chlorophyll / Turbidity) (S/N: FLNTURTD-939)		
Total raw files	1 file (.txt) / 5.56 MB	File name	Abyss0270_ECO.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Comments	- Sensor data positions (except RESON Multibeam) are not shifted to the corrected vehicle track		

Station	105	GEOMAR	Day (UTC)	26.03.2017
Dive	**Abyss0271**			



Mission goal:	Mission 271 was to extend the map from the dive 270
Times (UTC)	
Launch	14:26
Mission start	14:29
Survey start	14:32
Survey finished	03:48
Mission finished	03:56
Recovery	05:04
Distance travelled	74.71 km
Mission comments	- No Transponders (Bottom-Lock at surface) - Bottom following

Depth / Altitude	- the vehicle dived on a fix altitude of 40 m - survey depths between 200 and 350 meters		
Line spacing	- line spacing: 80		
Sensor	RESON Seabat 7125 200 kHz Multibeam		
Total raw files	77 files (.s7k) / 19.2 GB	First file	20170326_143239.s7k
Used raw files		Last file:	20170327_034420.s7k
Survey area covered:	Average coverage:		
Sensor	Magnetometer (APS-1540 S/N 0685) / Self Potential Sensor		
Total raw files	177 files (.B122) / 7.43 GB	First file	170326142000.B122
		Last file:	170327050500.B122
Comments	- Combined binary files include Magnetometer and Self Potential data - Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Eh / REDOX sensor (Koichi Nakamura)		
Total raw files	1 file (.txt) / 3.11 MB	File name	Abyss0271_REDOX.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	SeaBird SBE49 FastCAT CTD (S/N: 4948793-0168)		
Total raw files	1 file (.txt) / 18.9 MB	File name	Abyss0271_CTD.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Sensor	Wetlabs ECO FLNTU (Chlorophyll / Turbidity) (S/N: FLNTURTD-939)		
Total raw files	1 file (.txt) / 4.94 MB	File name	Abyss0271_ECO.txt
Comments	- Sensor data positions are not shifted to the corrected vehicle track		
Comments	- Sensor data positions (except RESON Multibeam) are not shifted to the corrected vehicle track		

Appendix 4: Heatflow Protocols

Station: POS510-01HF   Date: 2017-03-09   Anhydros Basin

No.	Latitude/* Longitude	Depth	Time in / Time out	Wire out	Penetr.	T_{max}	HP	Flux (mW/m^2)	Comment
H1706P1	36°33.89'N/ 25°27.49'E	400m	06:14 / 06:32	420m	-	15.59°C	-	-	boko @ 415m, max tension 8 kN, no change in tension during bottom time
H1706P2	36°34.59'N/ 25°26.88'E	410m	07:33 / 07:51	432m	-	15.57°C	-	-	boko @ 425m, max tension 8 kN, small tension; fiered add. 2 m after a few min
H1706P3	36°35.36'N/ 25°26.13'E	407m	08:43 / 09:00	426m	-	15.57°C	-	-	boko @ 421m, max tension 8 kN, no change in tension during bottom time
H1706P4	36°36.13'N/ 25°25.42'E	391m	10:31 / 10:48	409m	-	15.64°C	-	-	boko @ 404m, max tension 7 kN, no change in tension during bottom time
H1706P5	36°36.86'N/ 25°24.76'E	360m	11:47 / 12:05	378m	20cm	15.63°C	X	(-)	boko @ 372m, max tension 10 kN, no change in tension during bottom time

* Locations are ship position at bottom contact. Uncertainty of the position of the probe is >10m. HP = Heat Pulse.

Station: POS510-10HF **Date: 2017-03-11** **Kolumbo Seamount**

No.	Latitude/* Longitude	Depth	Time in / Time out	Wire out	Penetr.	T_{max}	HP	Flux (mW/m^2)	Comment
H1707P1	36°31.48'N/ 25°29.19'E	492m	07:22 / 07:40	516m	210cm	16.24°C	X	97	boko @ 511m, max tension 18 kN, no change in tension during bottom time
H1707P2	36°31.39'N/ 25°29.28'E	492m	08:09 / 08:27	516m	-	(15.97°C)	-	-	boko @ 511m, max tension 10 kN, no penetration at all
H1707P3	36°31.38'N/ 25°29.10'E	491m	08:55 / 09:13	514m	210cm	16.13°C	X	62	boko @ 509m, max tension 11 kN, no change in tension during bottom time
H1707P4	36°31.58'N/ 25°29.16'E	492m	10:31 / 10:48	515m	100cm	53.57°C	-	*(14820)*	boko @ 509m, max tension 9 kN, no change in tension during bottom time
H1707P5	36°31.58'N/ 25°29.22'E	492m	11:11 / 11:28	514m	-	41.65°C	-	-	boko @ 509m, max tension 10 kN, some tension; fiered 1 more meter
H1707P6	36°31.58'N/ 25°29.27'E	492m	11:50 / 12:08	515m	-	16.52°C	-	*(159)*	boko @ 511m, max tension 10 kN, no change in tension during bottom time
H1707P7	36°31.47'N/ 25°29.27'E	492m	12:41 / 12:58	517m	-	16.34°C	-	*(162)*	boko @ 511m, max tension 10 kN, no change in tension during bottom time

* Locations are ship position at bottom contact. Uncertainty of the position of the probe is >10m. HP = Heat Pulse. Values in parenthesis are calculated assuming a thermal conductivity of 1 and are very approximate.

Station: POS510-21 to 24HF **Date: 2017-03-13** **Anhydros Basin**

No.	Latitude/* Longitude	Depth	Time in / Time out	Wire out	Penetr.	T_{max}	HP	Flux (mW/m^2)	Comment
H1708P1	36°33.82'N/ 25°22.00'E	305m	06:11 / 06:27	320m	030cm	15.65°C	-	-	boko @ 315m, max tension 7 kN, no change in tension during bottom time
H1708P2	36°38.01'N/ 25°30.02'E	418m	07:53 / 08:11	440m	130cm	15.25°C	-	-	boko @ 435m, max tension 7 kN, no change in tension during bottom time
H1708P3	36°41.06'N/ 25°36.07'E	449m	10:21 / 10:39	474m	few cm	15.37°C	-	-	boko @ 469m, max tension 8 kN, no change in tension during bottom time
H1708P4	36°44.51'N/ 25°39.52'E	473m	11:52 / 12:10	496m	170cm	15.23°C	-	-	boko @ 491m, max tension 14 kN, no change in tension during bottom time

* Locations are ship position at bottom contact. Uncertainty of the position of the probe is >10m. HP = Heat Pulse.

Station: POS510-31HF **Date: 2017-03-15** **Santorini Caldera NE Basin**

No.	Latitude/* Longitude	Depth	Time in / Time out	Wire out	Penetr.	T_{max}	HP	Flux (mW/m^2)	Comment
H1709P1	36°27.19'N/ 25°24.47'E	215m	08:03 / 08:21	241m	210cm	23.40°C	X	1305	boko @ 236m, max tension 8 kN, no change in tension during bottom time
H1709P2	36°27.21'N/ 25°24.16'E	278m	08:51 / 09:08	304m	210cm	21.75°C	X	1496	boko @ 299m, max tension 14 kN, no change in tension during bottom time
H1709P3	36°26.97'N/ 25°24.16'E	327m	10:34 / 10:51	352m	ca.100cm	20.81°C	-	*(1163)*	boko @ 346m, max tension 7 kN, some tension, 1 m extra fieren
H1709P4	36°26.81'N/ 25°24.15'E	340m	11:17 / 11:35	360m	30cm	16.14°C	X	506	boko @ 355m, max tension 11 kN, no change in tension during bottom time
H1709P5	36°26.87'N/ 25°23.84'E	349m	12:05 / 12:23	369m	70cm	16.18°C	-	*(231)*	boko @ 364m, max tension 7 kN, no change in tension during bottom time
H1709P6	36°26.94'N/ 25°23.60'E	367m	12:58 / 13:16	390m	30cm	16.12°C	X	675	boko @ 385m, max tension 10 kN, no change in tension during bottom time
H1709P7	36°26.55'N/ 25°24.47'E	375m	14:12 / 14:30	397m	-	15.98°C	-	*(49)*	boko @ 391m, max tension 7 kN, no change in tension during bottom time
H1709P8	36°27.20'N/ 25°24.45'E	209m	15:11 / 15:28	238m	60cm	23.50°C	X	(-)	boko @ 232m, max tension 12 kN, no change in tension during bottom time

* Locations are ship position at bottom contact. Uncertainty of the position of the probe is >10m. HP = Heat Pulse. Values in parenthesis are calculated assuming a thermal conductivity of 1 and are very approximate.

Station: POS510-32 to 34HF Date: 2017-03-16 Anhydros Basin

No.	Latitude/* Longitude	Depth	Time in / Time out	Wire out	Penetr.	T_{max}	HP	Flux (mW/m^2)	Comment
H1710P1	36°40.00'N/ 25°37.52'E	471m	06:12 / 06:30	496m	ca.100cm	15.36°C	-	-	boko @ 491m, max tension 8 kN, no change in tension during bottom time
H1710P2	36°37.99'N/ 25°34.01'E	456m	07:31 / 07:53	480m	ca.100cm	15.36°C	-	-	boko @ 475m, max tension 10 kN, some tension, 2m extra wire
H1710P3	36°36.30'N/ 25°33.49'E	446m	08:36 / 08:53	469m	few cm	15.38°C	-	-	boko @ 464m, max tension 8 kN, no change in tension during bottom time
H1710P4	36°35.70'N/ 25°33.51'E	435m	10:19 / 10:37	459m	50cm	15.36°C	-	-	boko @ 452m, max tension 9 kN, no change in tension during bottom time
H1710P5	36°35.00'N/ 25°33.50'E	449m	11:32 / 11:49	473m	120cm	15.36°C	-	-	boko @ 466m, max tension 9 kN, no change in tension during bottom time
H1710P6	36°34.51'N/ 25°34.19'E	451m	12:33 / 12:51	473m	ca.100cm	15.34°C	-	-	boko @ 468m, max tension 11 kN, no change in tension during bottom time

* Locations are ship position at bottom contact. Uncertainty of the position of the probe is >10m. HP = Heat Pulse.

Station: POS510-57 to 58HF   Date: 2017-03-19   Amorgos Basin

No.	Latitude/* Longitude	Depth	Time in / Time out	Wire out	Penetr.	T_{max}	HP	Flux (mW/m^2)	Comment
H1711P1	36°42.00'N/ 25°48.00'E	435m	13:11 / 13:28	457m	100cm	15.26°C	X	-60	boko @ 452m, max tension 22 kN, no change in tension during bottom time
H1711P2	36°38.26'N/ 25°48.24'E	704m	14:39 / 14:57	738m	080cm	14.94°C	-	*(-144)*	boko @ 733m, max tension 12 kN, no change in tension during bottom time

* Locations are ship position at bottom contact. Uncertainty of the position of the probe is >10m. HP = Heat Pulse. Values in parenthesis are calculated assuming a thermal conductivity of 1 and are very approximate.

Station: POS510-72 to 73HF   Date: 2017-03-21   Anafi Basin

No.	Latitude/* Longitude	Depth	Time in / Time out	Wire out	Penetr.	T_{max}	HP	Flux (mW/m^2)	Comment
H1712P1	36°28.00'N/ 25°45.01'E	603m	08:20 / 08:38	631m	100cm	14.83°C	-	*(-18)*	boko @ 626m, max tension 10 kN, no change in tension during bottom time
H1712P2	36°25.00'N/ 25°41.68'E	557m	10:25 / 10:43	583m	120cm	14.99°C	-	*(10)*	boko @ 578m, max tension 10 kN, no change in tension during bottom time
H1712P3	36°25.01'N/ 25°41.69'E	556m	10:49 / 11:07	584m	100cm	14.97°C	-	*(-16)*	boko @ 578m, max tension 10 kN, no change in tension during bottom time

* Locations are ship position at bottom contact. Uncertainty of the position of the probe is >10m. HP = Heat Pulse. Values in parenthesis are calculated assuming a thermal conductivity of 1 and are very approximate.

Station: POS510-81HF **Date: 2017-03-22** **Anhydros Basin**

No.	Latitude/* Longitude	Depth	Time in / Time out	Wire out	Penetr.	T_{max}	HP	Flux (mW/m^2)	Comment
H1713P1	36°37.41'N/ 25°34.72'E	415m	13:17 / 13:35	434m	050cm	15.42°C	X	56	boko @ 428m, max tension 13 kN, no change in tension during bottom time
H1713P2	36°37.42'N/ 25°34.72'E	420m	13:43 / 14:00	434m	040cm	15.42°C	X	63	boko @ 428m, max tension 18 kN, no change in tension during bottom time

* Locations are ship position at bottom contact. Uncertainty of the position of the probe is >10m. HP = Heat Pulse.

Station: POS510-83 to 85HF **Date: 2017-03-23** **Kolumbo Line & Seamount**

No.	Latitude/* Longitude	Depth	Time in / Time out	Wire out	Penetr.	T_{max}	HP	Flux (mW/m^2)	Comment
H1714P1	36°30.57'N/ 25°26.53'E	364m	07:04 / 07:22	385m	150cm	15.38°C	X	-125	boko @ 380m, max tension 13 kN, no change in tension during bottom time
H1714P2	36°29.86'N/ 25°27.36'E	292m	07:56 / 08:14	309m	030cm	15.47°C	-	*(-122)*	boko @ 302m, max tension 8 kN, no change in tension during bottom time
H1714P3	36°31.65'N/ 25°29.27'E	478m	09:02 / 09:19	511m	120cm	20.18°C	-	*(1613)*	boko @ 505m, max tension 10 kN, some tension, first attempt failed
H1714P4	36°31.65'N/ 25°29.16'E	480m	10:36 / 10:53	508m	90cm	16.55°C	-	*(519)*	boko @ 502m, max tension 8 kN, no change in tension during bottom time
H1714P5	36°31.49'N/ 25°29.36'E	487m	11:26 / 11:43	514m	100cm	16.25°C	X	332	boko @ 508m, max tension 12 kN, no change in tension during bottom time
H1714P6	36°31.30'N/ 25°29.33'E	488m	12:04 / 12:09	516m	-	-	-	-	boko @ 510m, toppled twice; no further attempt
H1714P7	36°31.31'N/ 25°29.22'E	490m	12:24 / 12:41	515m	100cm	15.88°C	-	*(58)*	boko @ 507m, max tension 10 kN, no change in tension during bottom time
H1714P8	36°31.29'N/ 25°29.07'E	485m	13:01 / 13:18	506m	130cm	15.82°C	-	*(-6)*	boko @ 500m, max tension 9 kN, no change in tension during bottom time
H1714P9	36°31.50'N/ 25°29.07'E	490m	13:38 / 13:56	515m	130cm	16.08°C	-	*(34)*	boko @ 509m, max tension 9 kN, no change in tension during bottom time

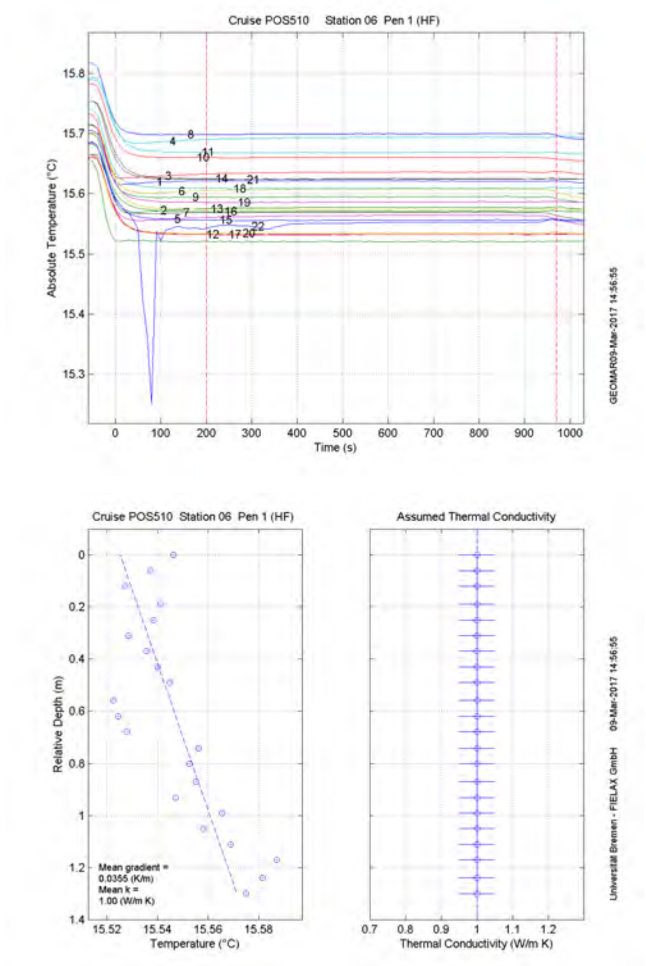
* Locations are ship position at bottom contact. Uncertainty of the position of the probe is >10m. HP = Heat Pulse. Values in parenthesis are calculated assuming a thermal conductivity of 1 and are very approximate.

Station: POS510-104HF Date: 2017-03-26 Santorini Caldera SW Basin

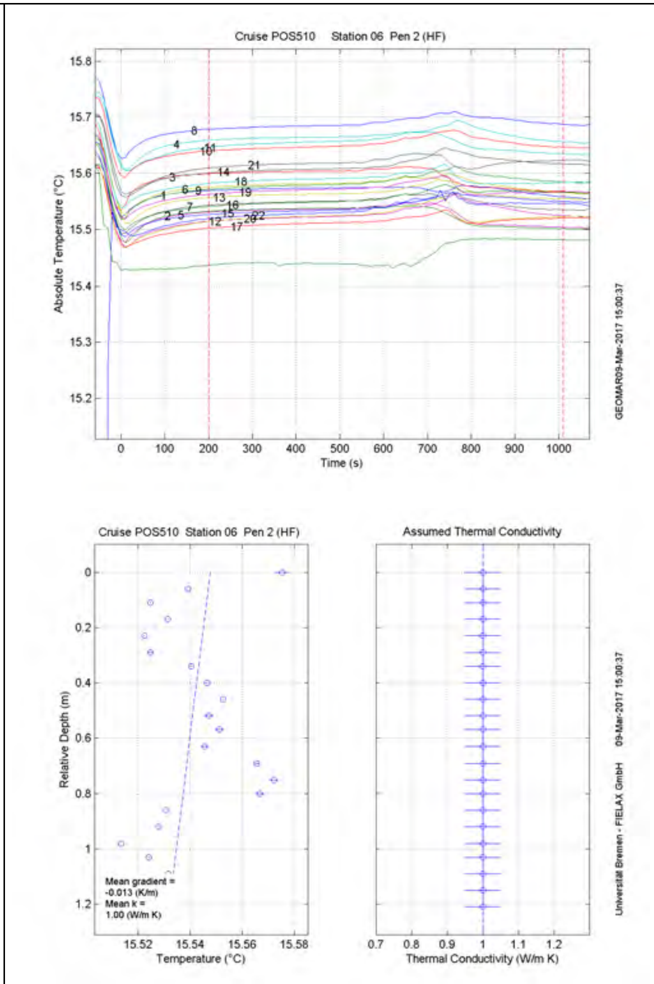
No.	Latitude/* Longitude	Depth	Time in / Time out	Wire out	Penetr.	T_{max}	HP	Flux (mW/m^2)	Comment
H1715P1	36°24.72'N/ 25°21.67'E	225m	08:16 / 08:33	240m	050cm	16.09°C	-	*(89)*	boko @ 235m, max tension 7 kN, no change in tension during bottom time
H1715P2	36°24.43'N/ 25°21.64'E	270m	09:36 / 09:53	309m	-	15.88°C	-	-	boko @ 303m, max tension 7 kN, no change in tension during bottom time
H1715P3	36°23.28'N/ 25°22.14'E	202m	11:02 / 11:19	293m	100cm	23.50°C	X	8064	boko @ 287m, max tension 9 kN, some tension, first attempt failed
H1715P4	36°23.11'N/ 25°22.09'E	268m	11:41 / 11:59	295m	090cm	26.42°C	-	*(7058)*	boko @ 289m, max tension 6 kN, no change in tension during bottom time
H1715P5	36°23.14'N/ 25°22.04'E	235m	12:13 / 12:30	267m	060cm	19.54°C	-	*(2688)*	boko @ 260m, max tension 5 kN, no change in tension during bottom time
H1715P6	36°23.13'N/ 25°22.02'E	220m	12:34 / 12:52	251m	090cm	16.87	-	*(1068)*	boko @ 245m, max tension 5 kN, no change in tension during bottom time

* Locations are ship position at bottom contact. Uncertainty of the position of the probe is >10m. HP = Heat Pulse. Values in parenthesis are calculated assuming a thermal conductivity of 1 and are very approximate.

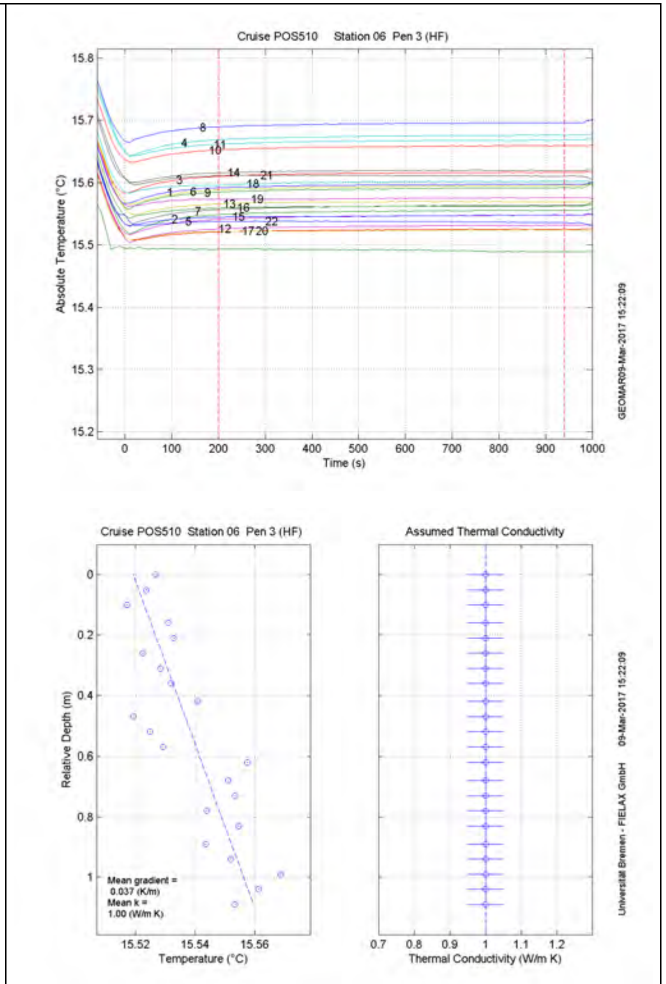
Appendix: Images



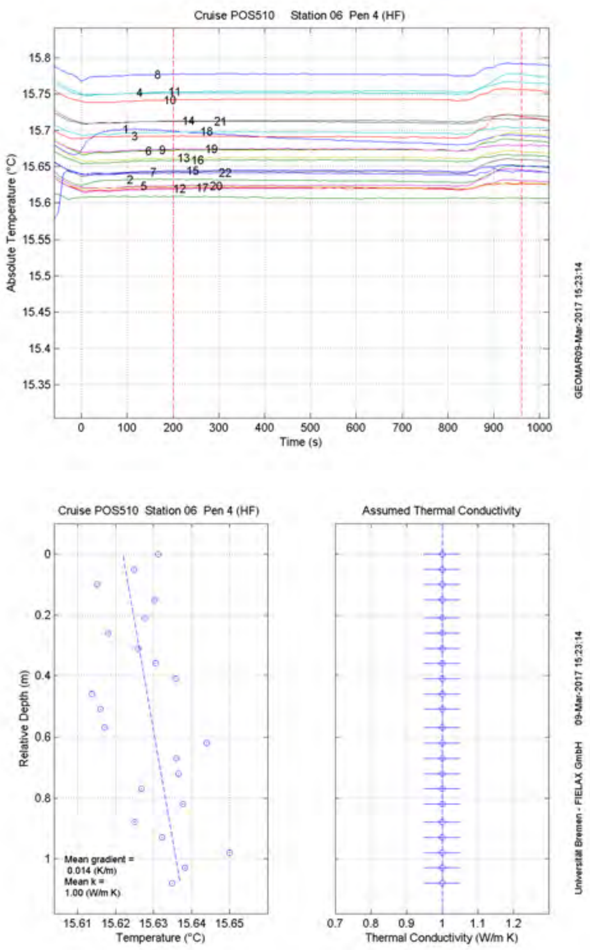
Station H1706P1



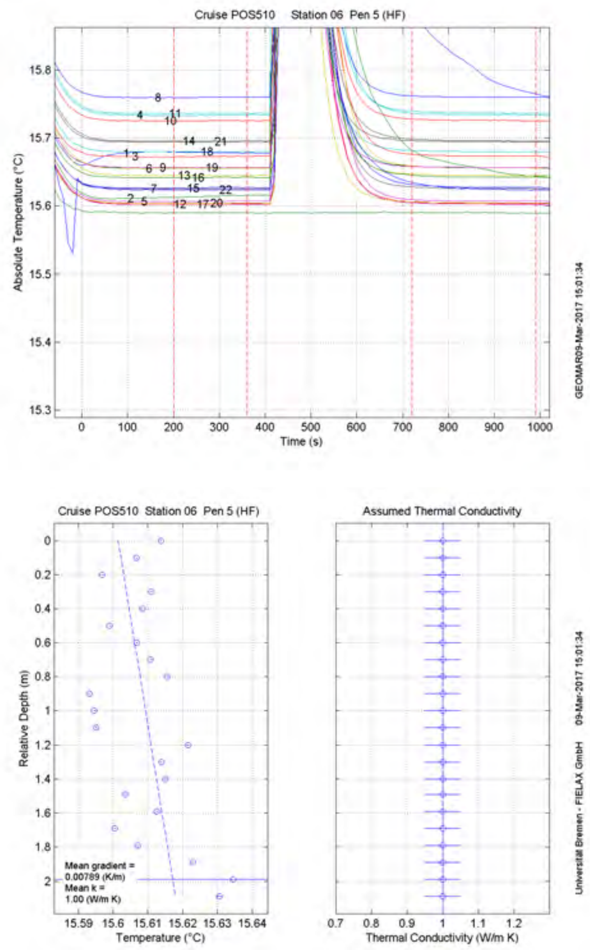
Station H1706P2



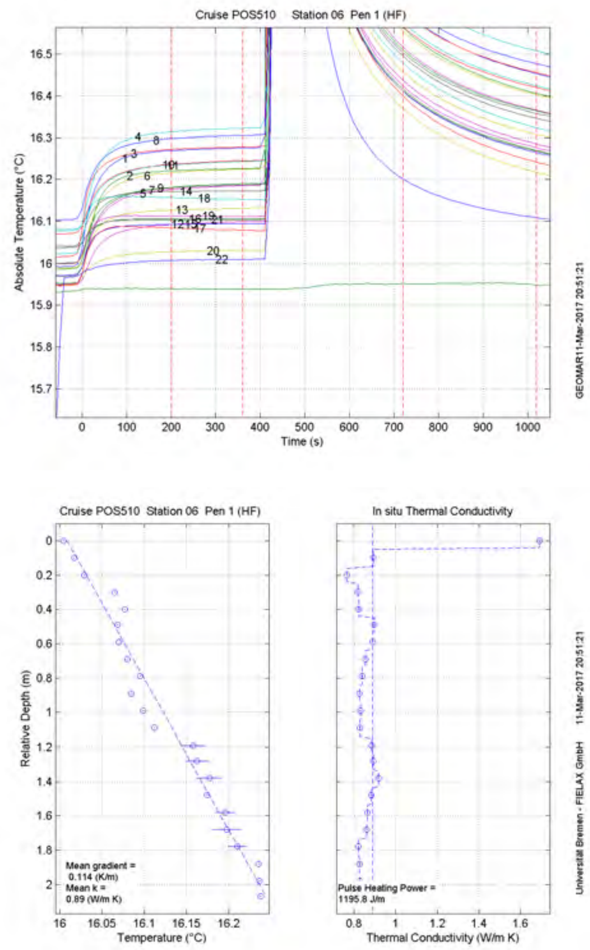
Station H1706P3



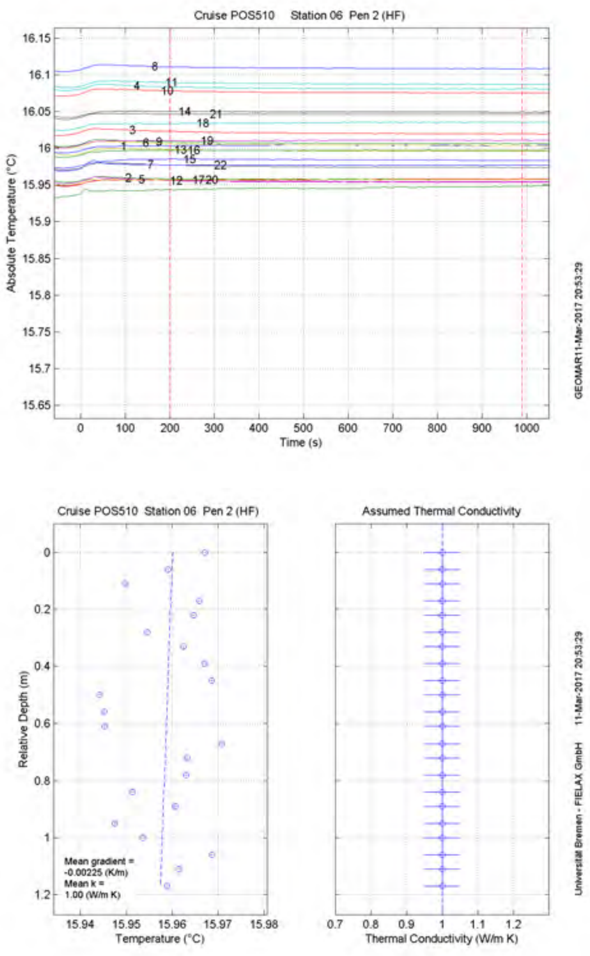
Station H1706P4



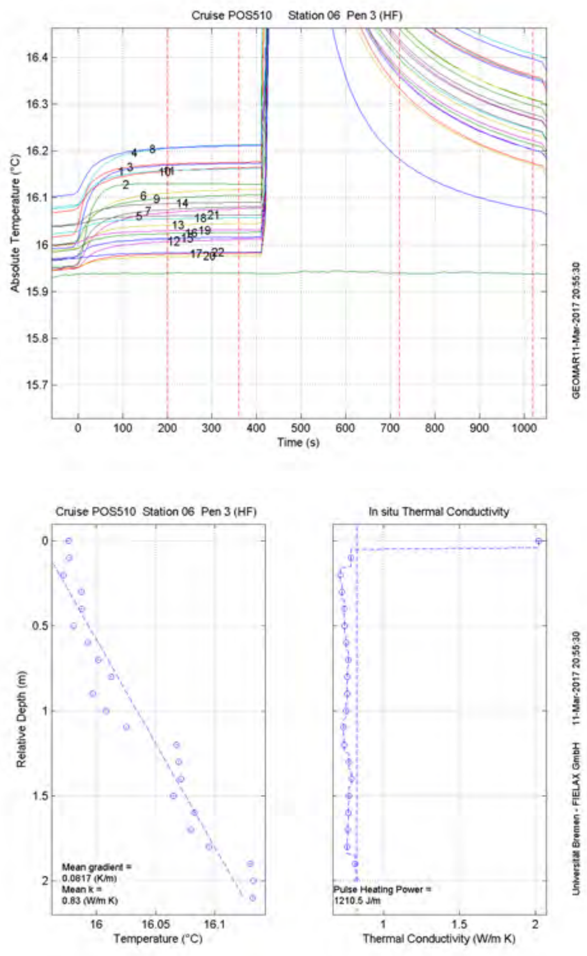
Station H1706P5



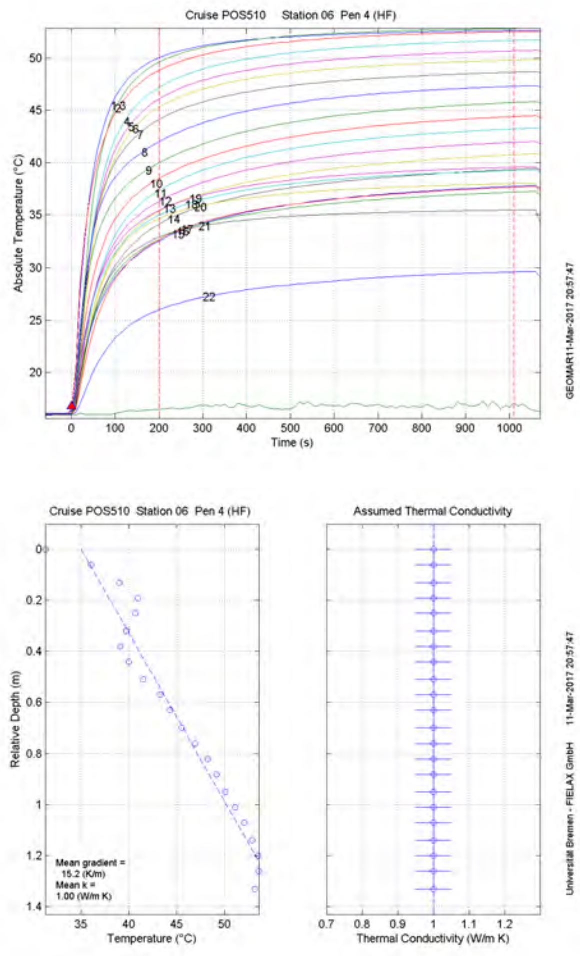
Station H1707P1



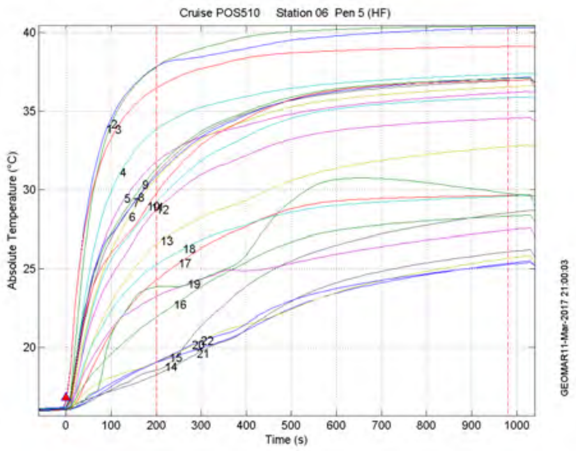
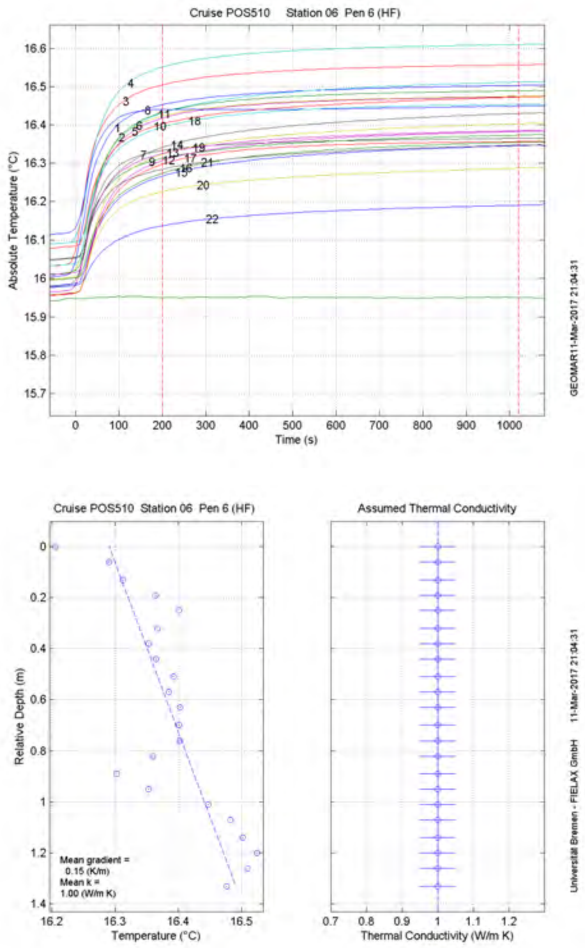
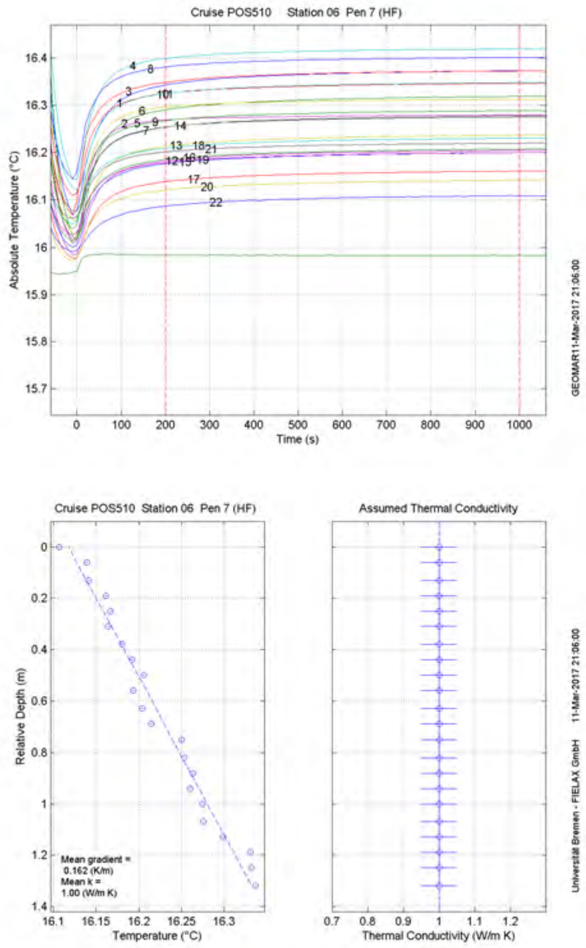
Station H1707P2

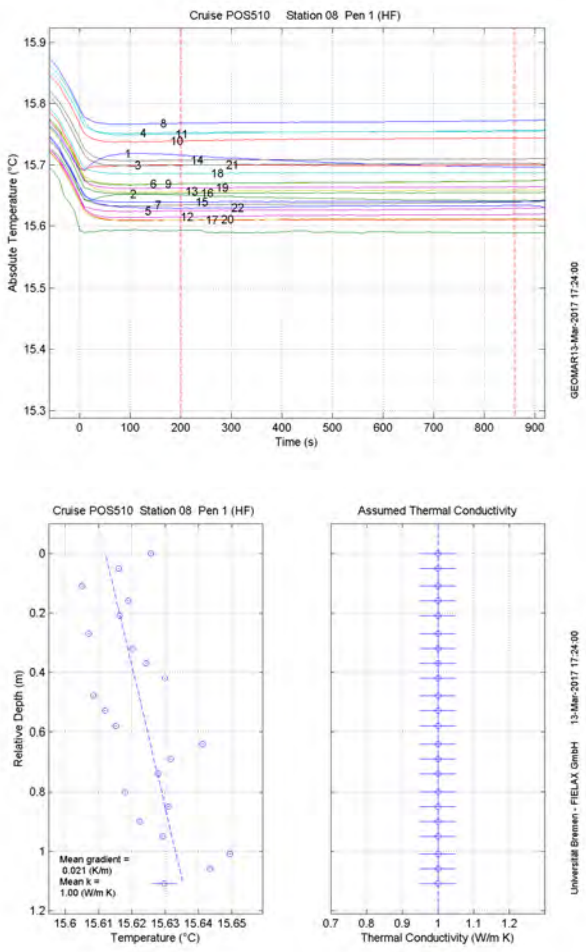


Station H1707P3

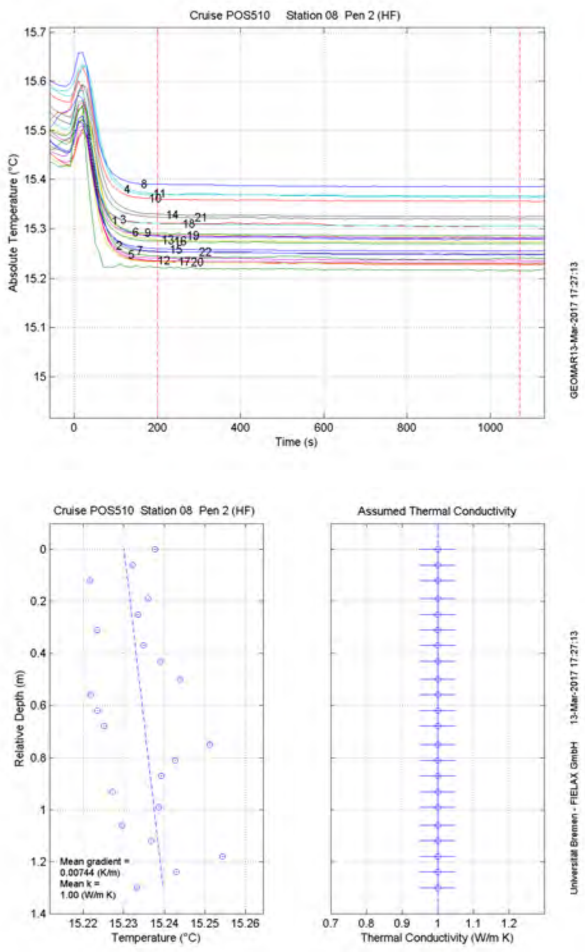


Station H1707P4

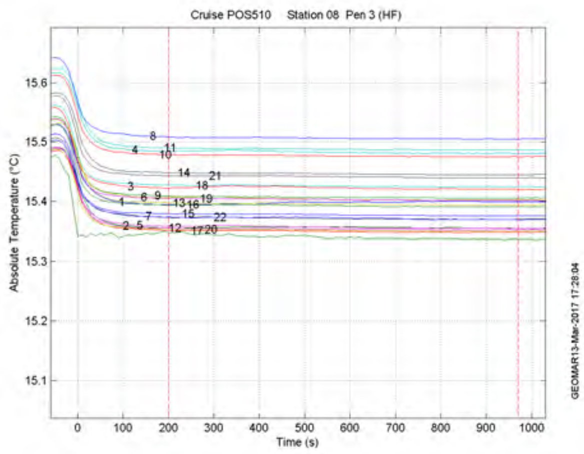
 Station H1707P5	 Station H1707P6	 Station H1707P7



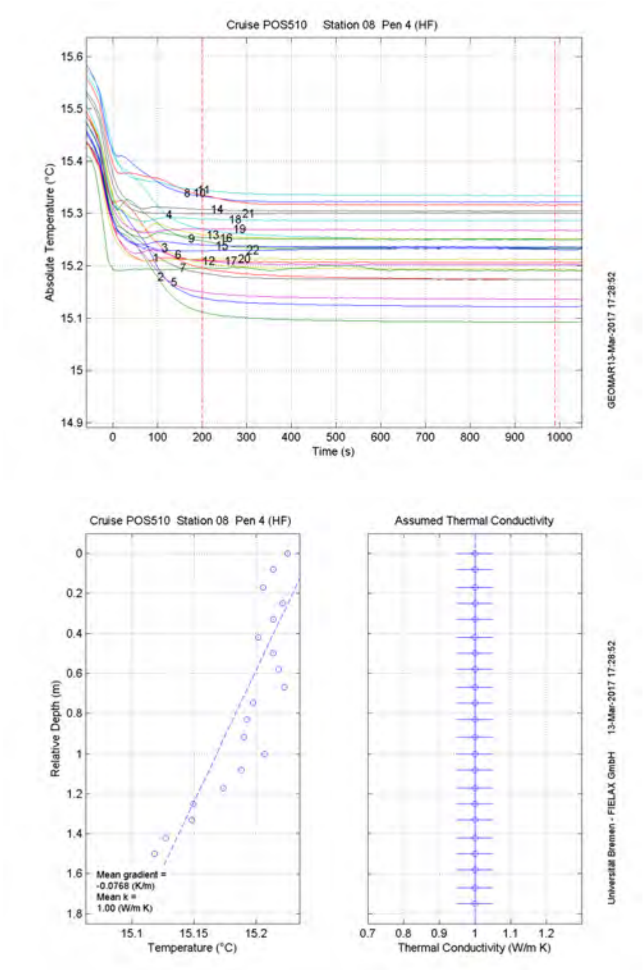
Station H1708P1



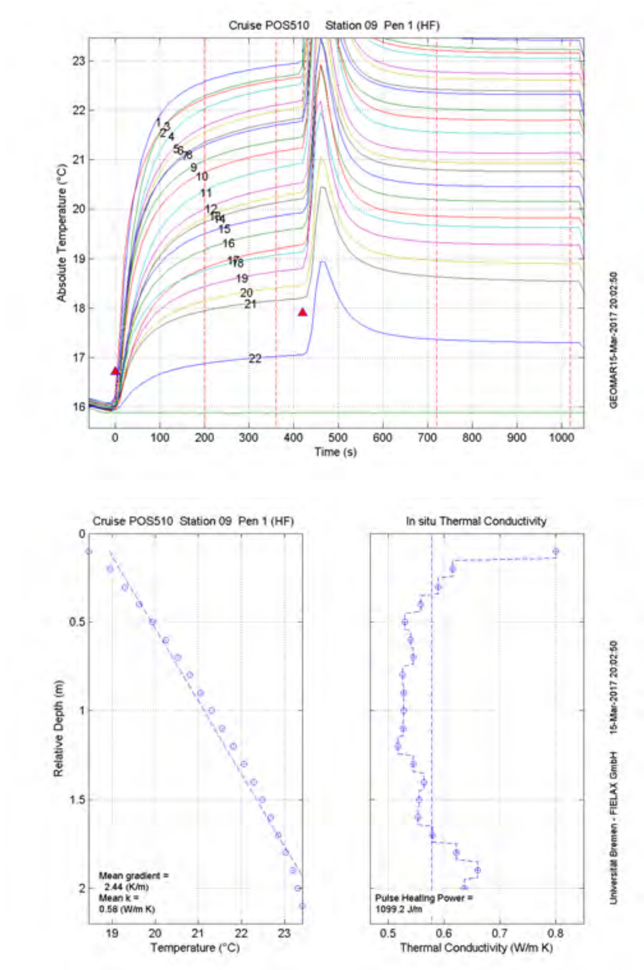
Station H1708P2



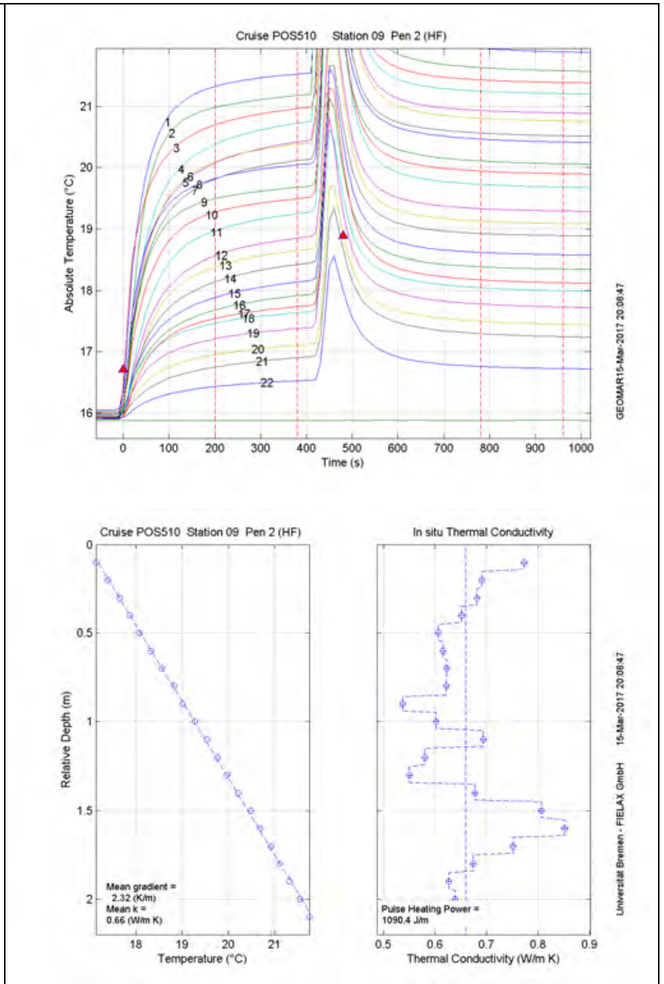
Station H1708P3



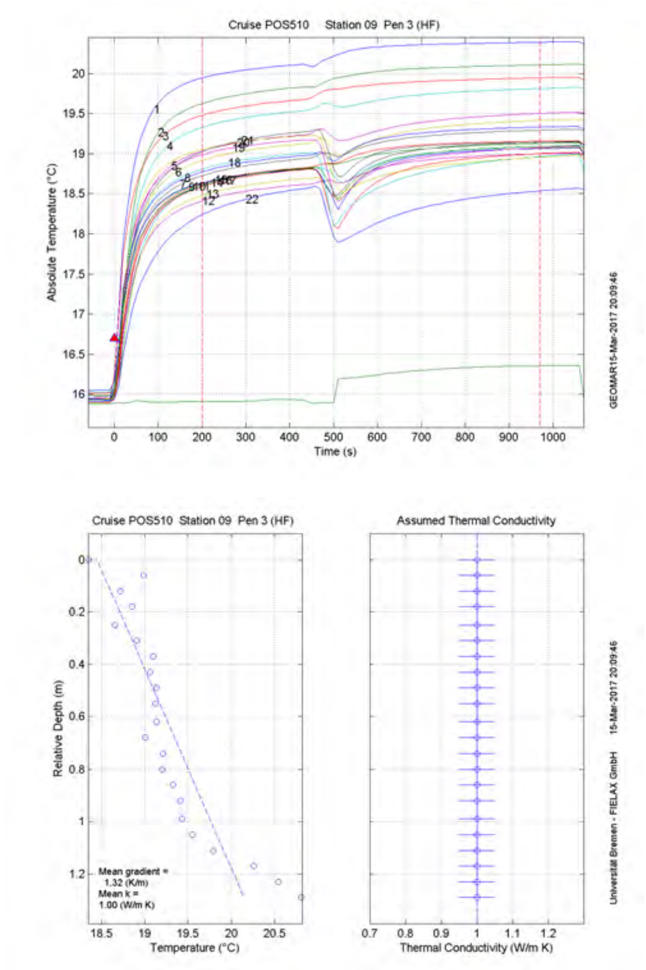
Station H1708P4



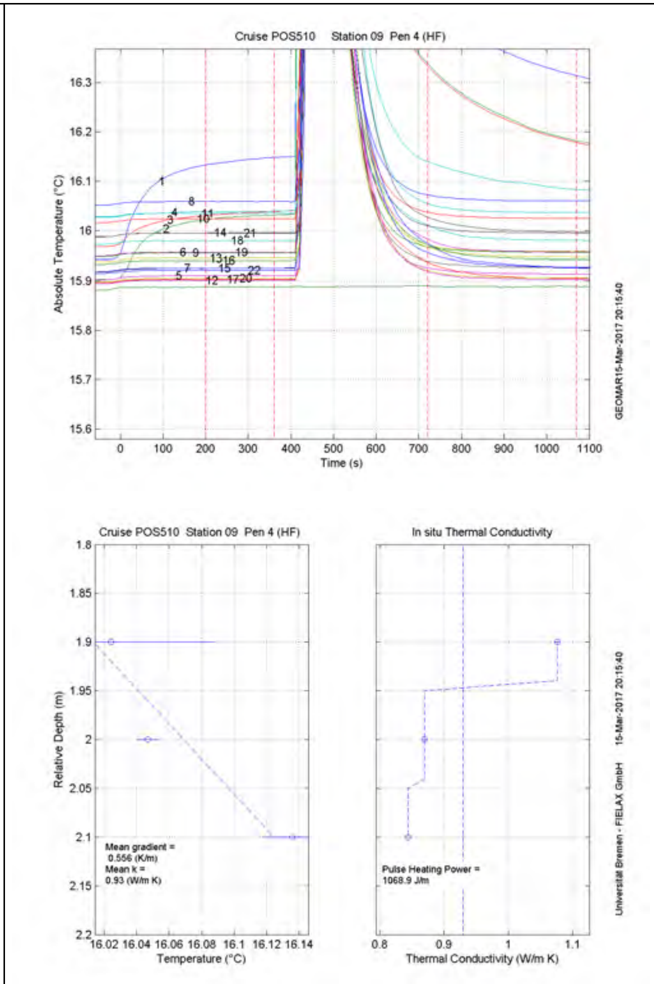
Station H1709P1



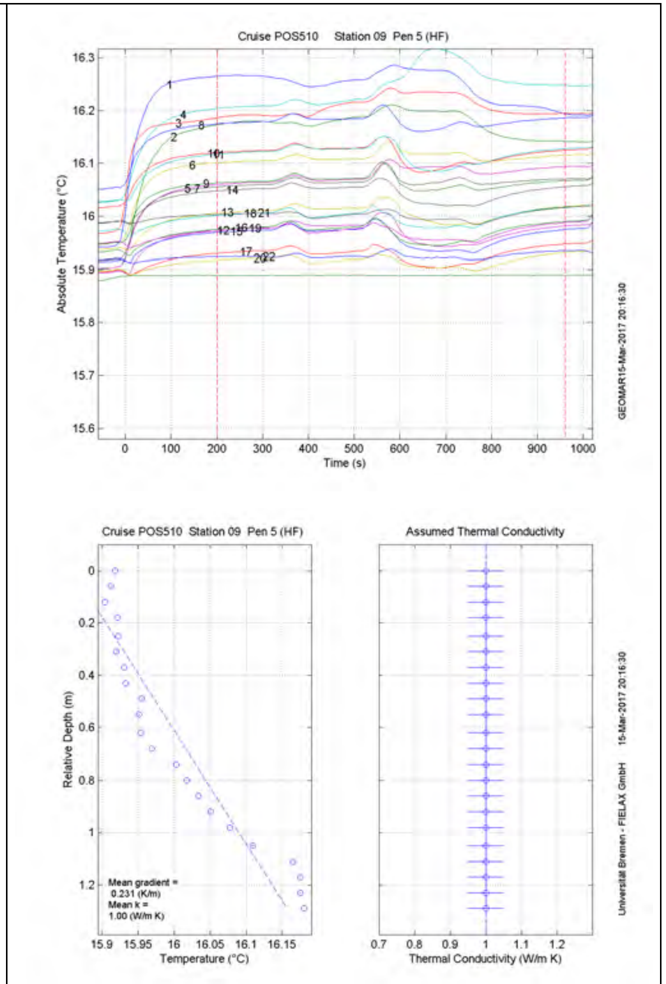
Station H1709P2



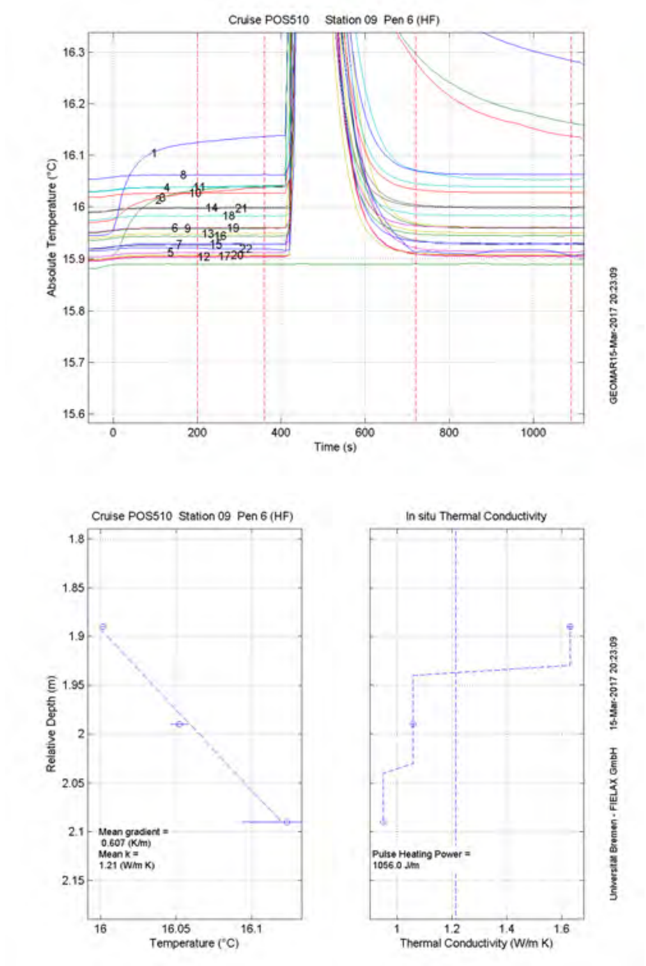
Station H1709P3



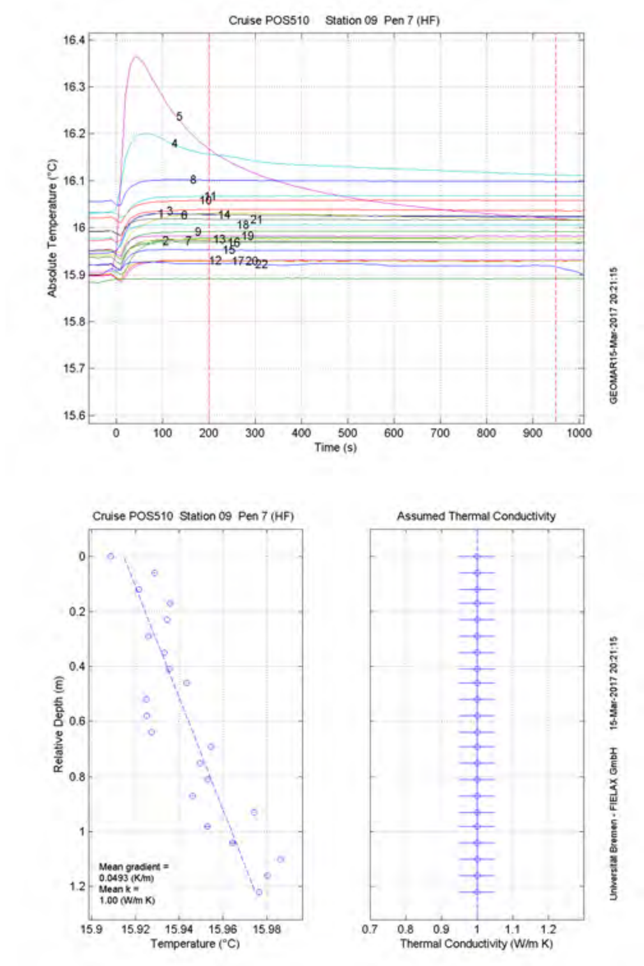
Station H1709P4



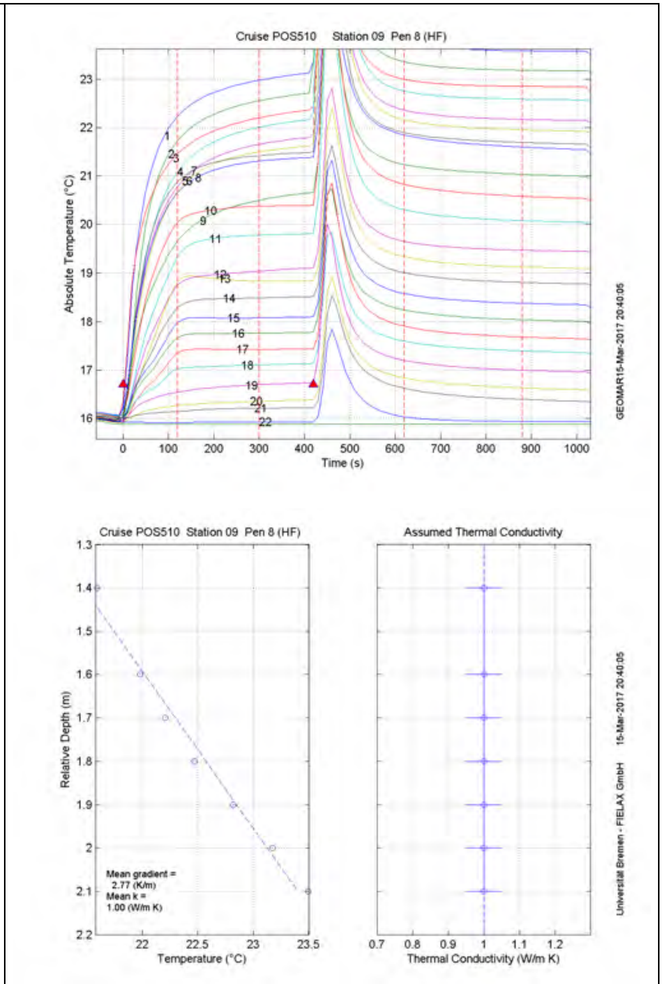
Station H1709P5



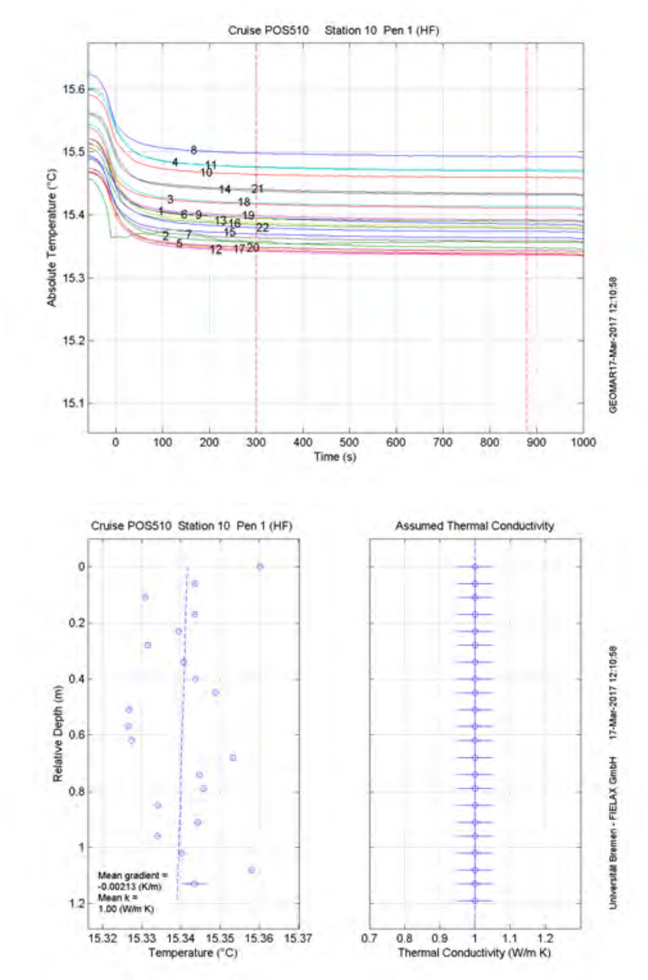
Station H1709P6



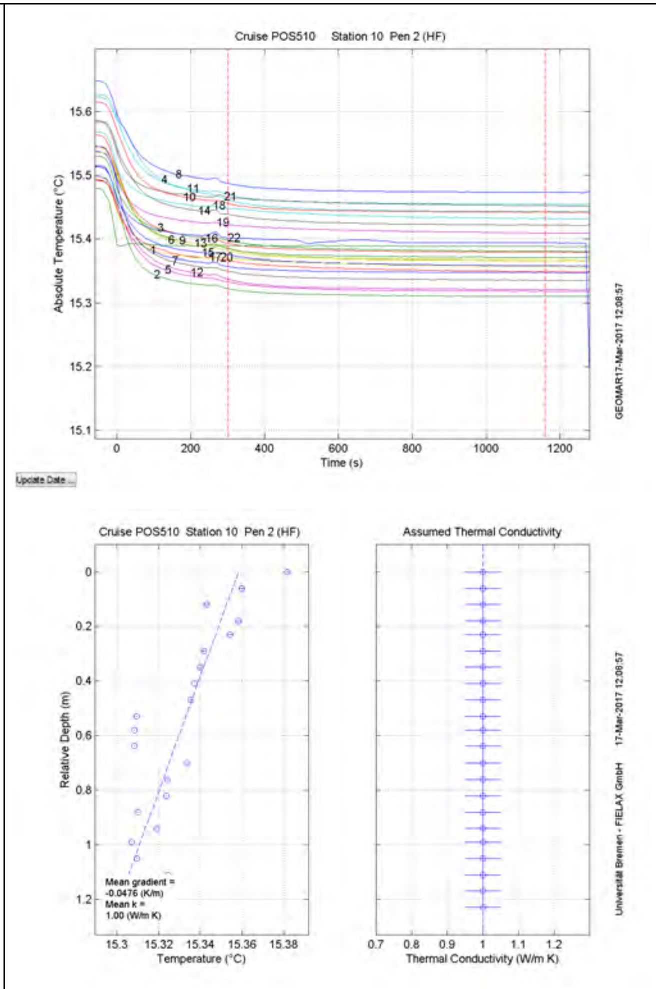
Station H1709P7



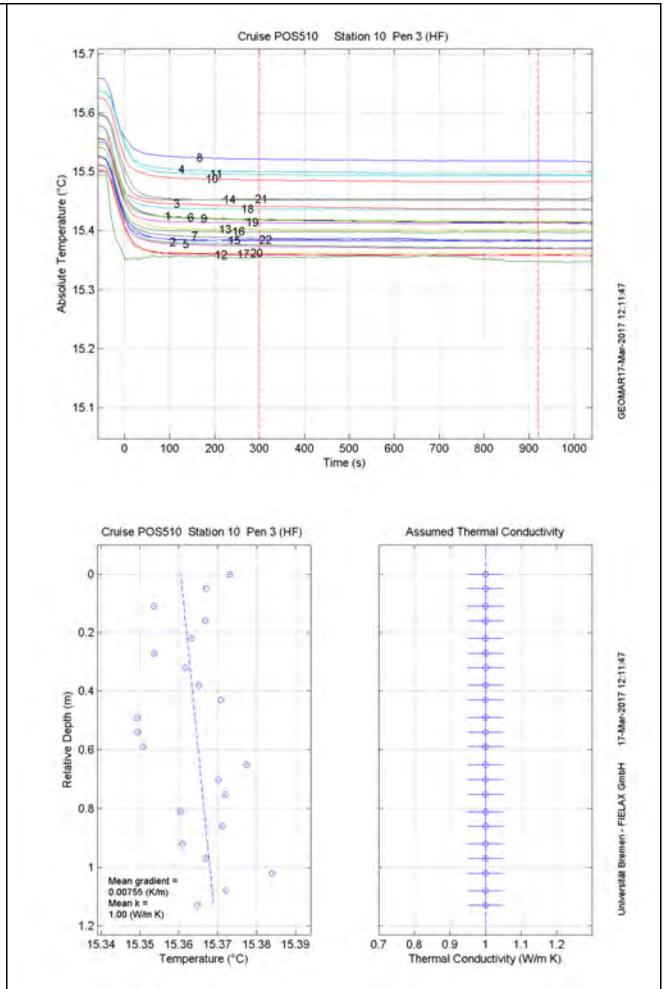
Station H1709P8



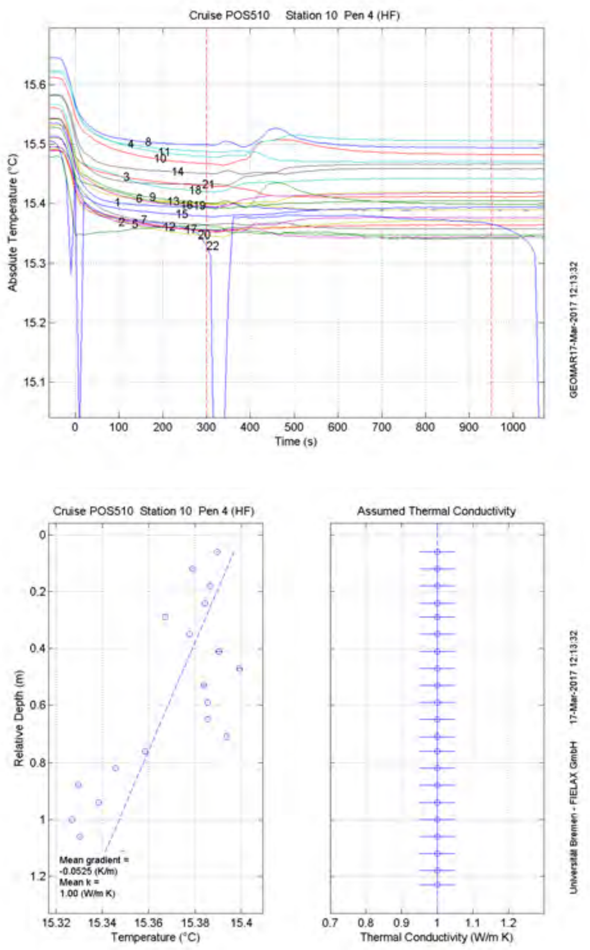
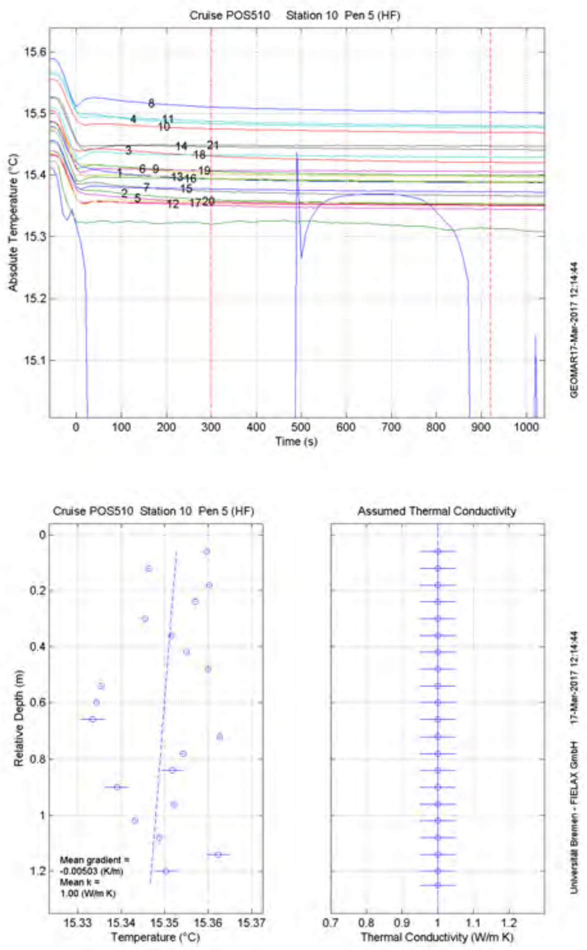
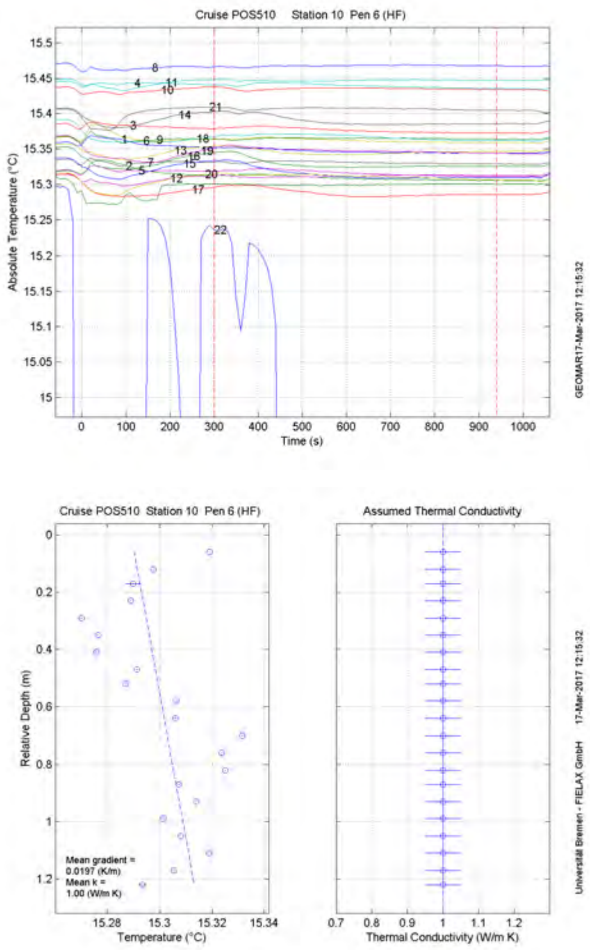
Station H1710P1

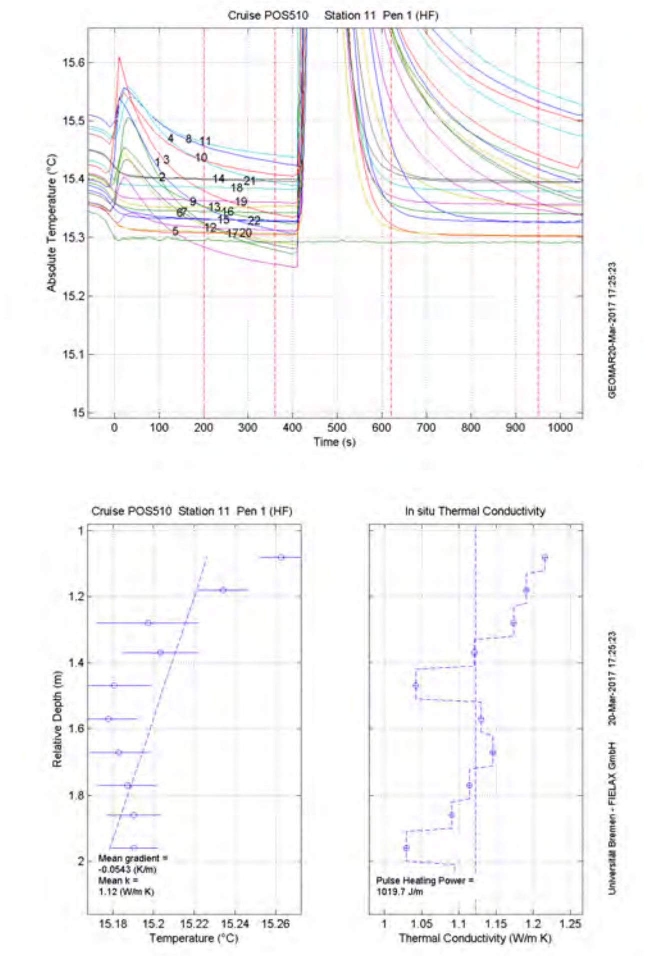


Station H1710P2

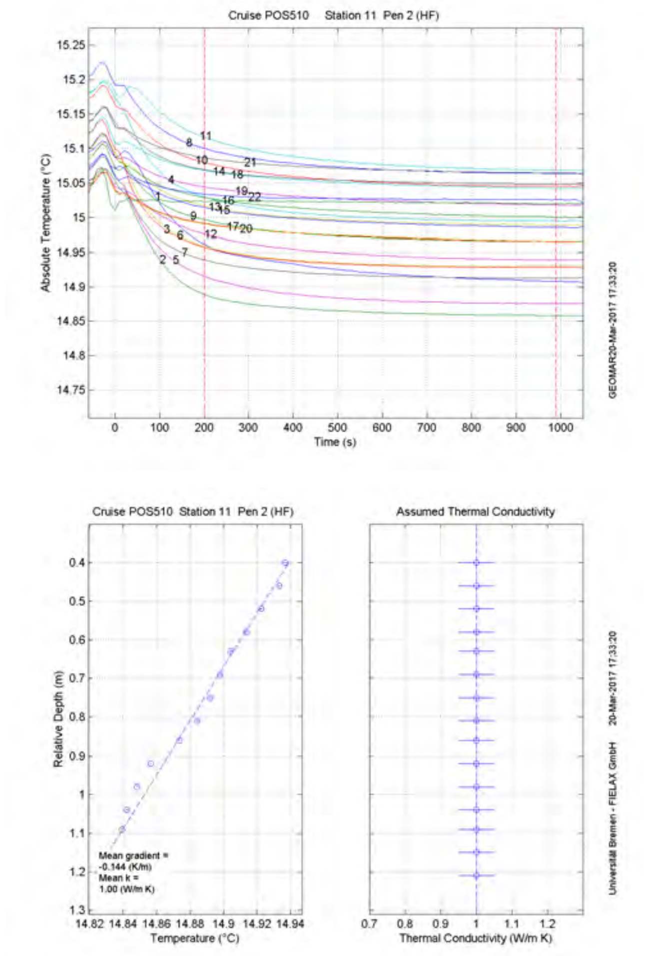


Station H1710P3

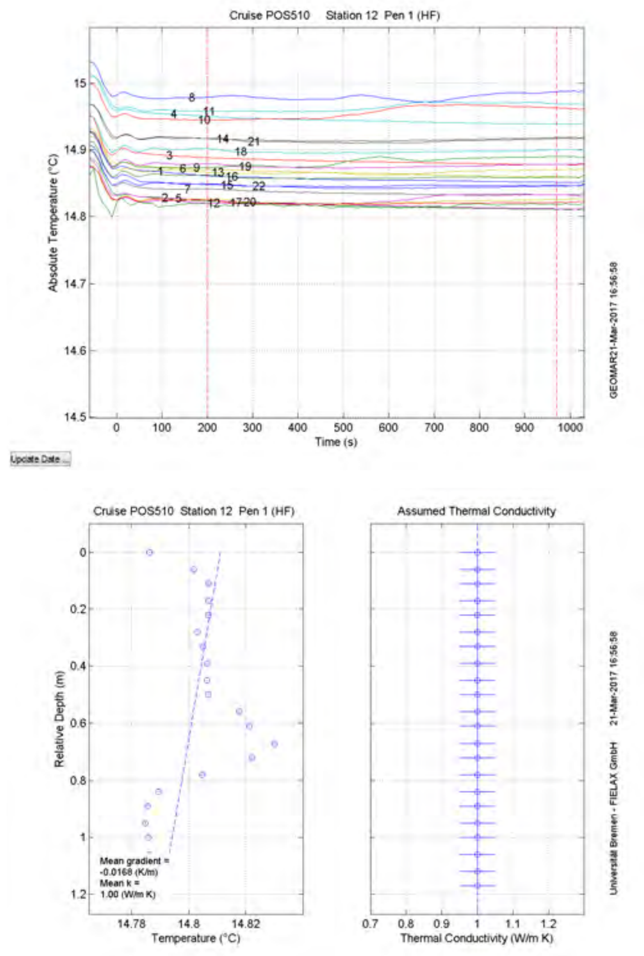
		
Station H1710P4	Station H1710P5	Station H1710P6



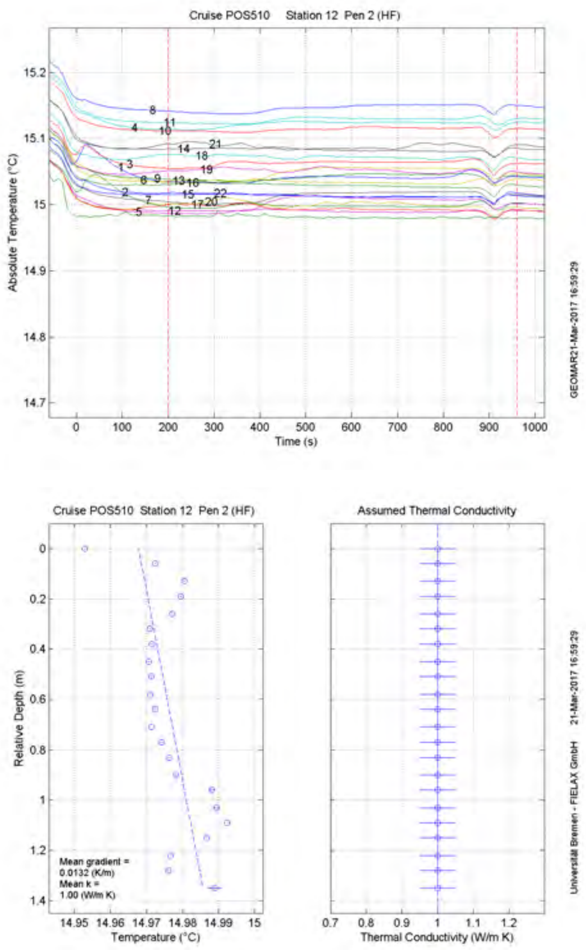
Station H1711P1



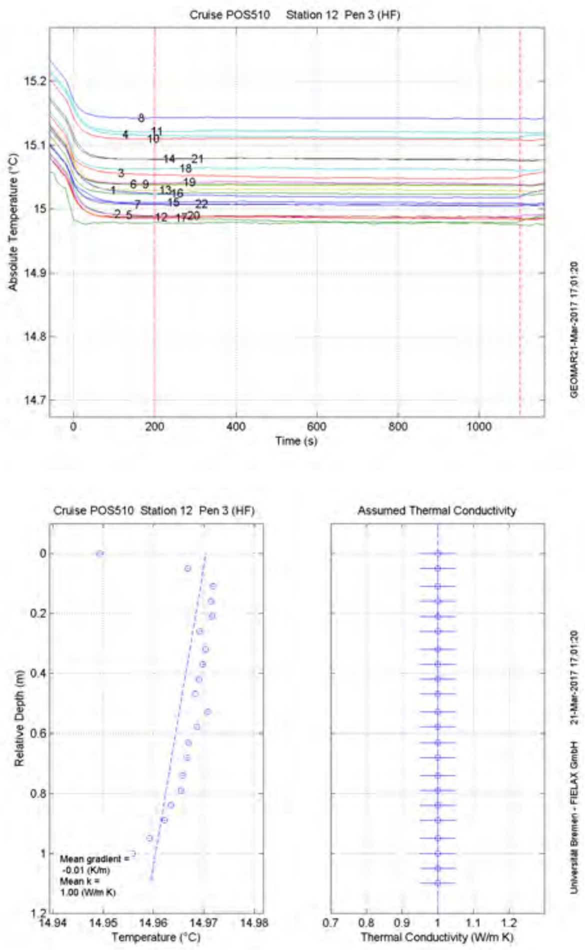
Station H1711P2



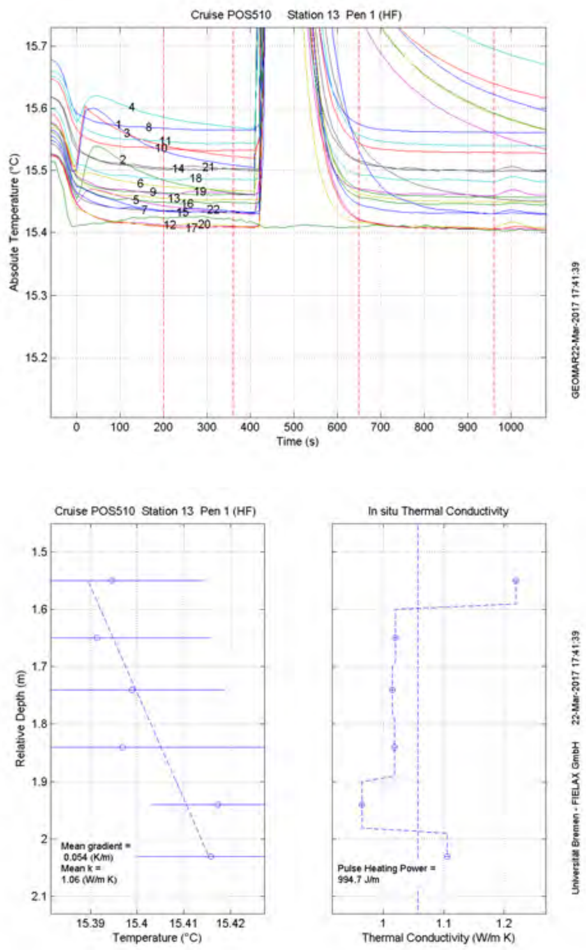
Station H1712P1



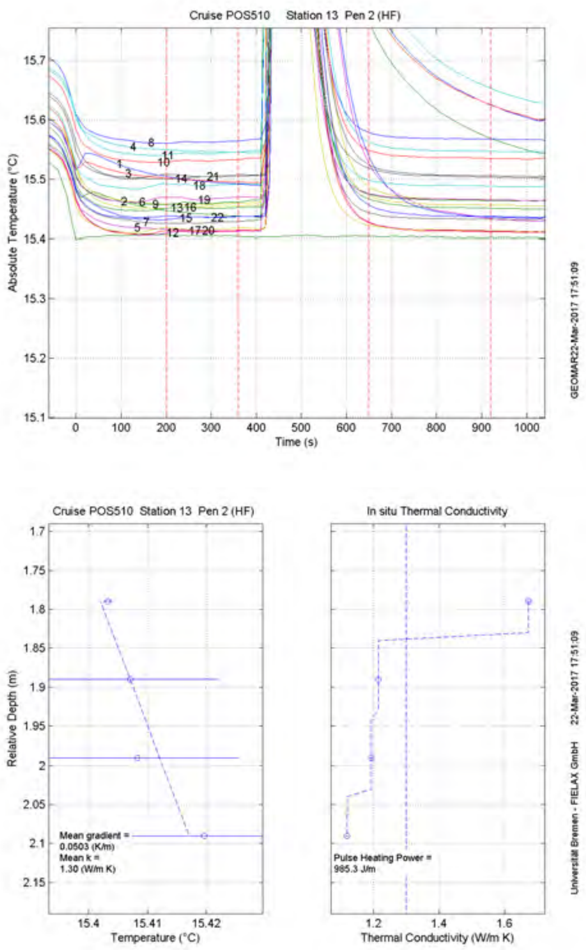
Station H1712P2



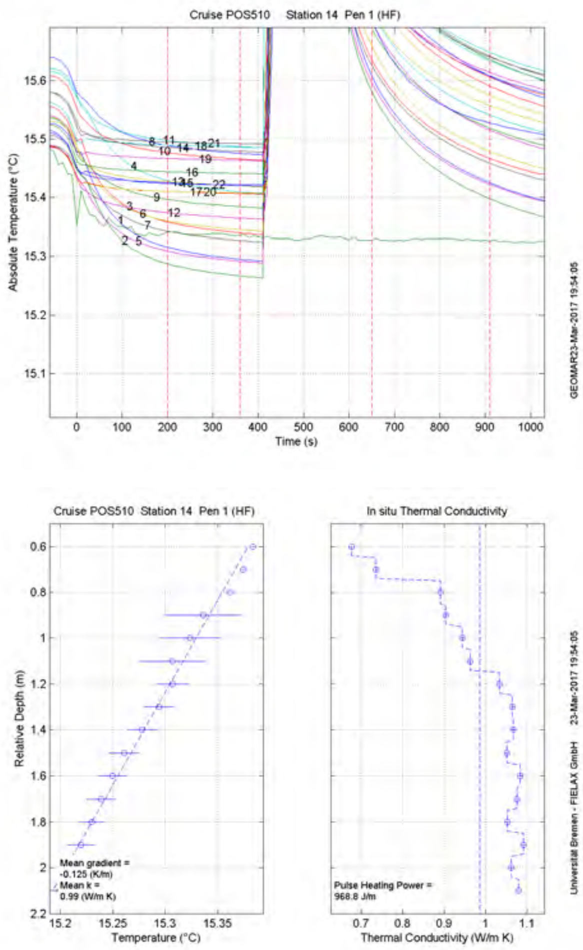
Station H1712P3



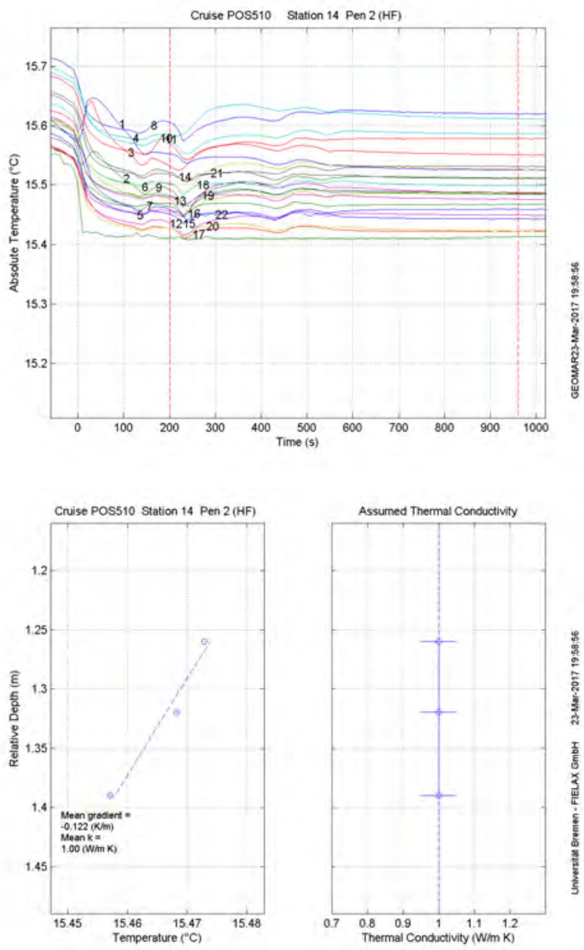
Station H1713P1



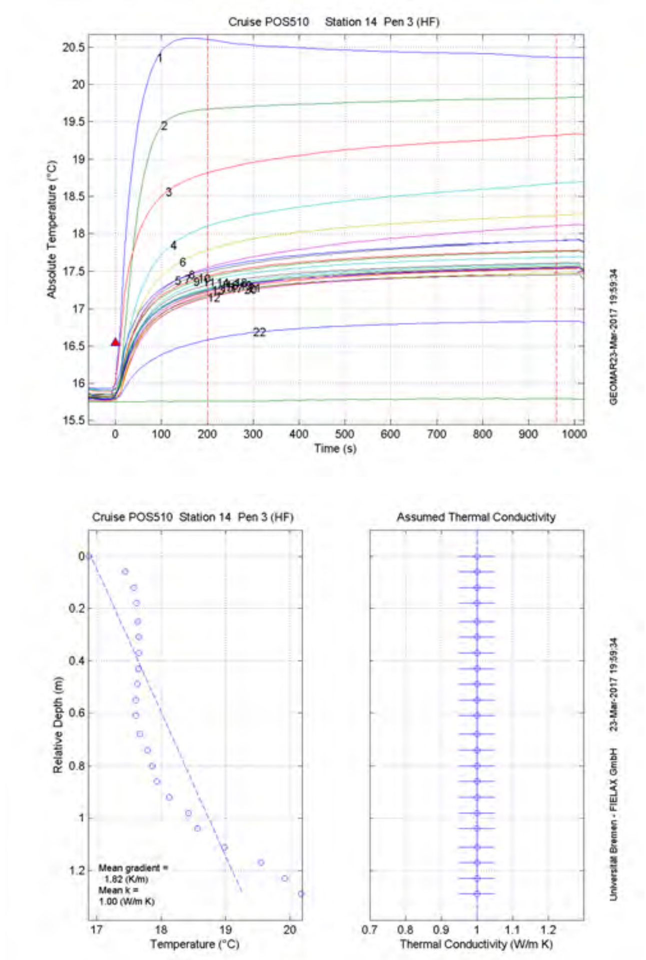
Station H1713P2



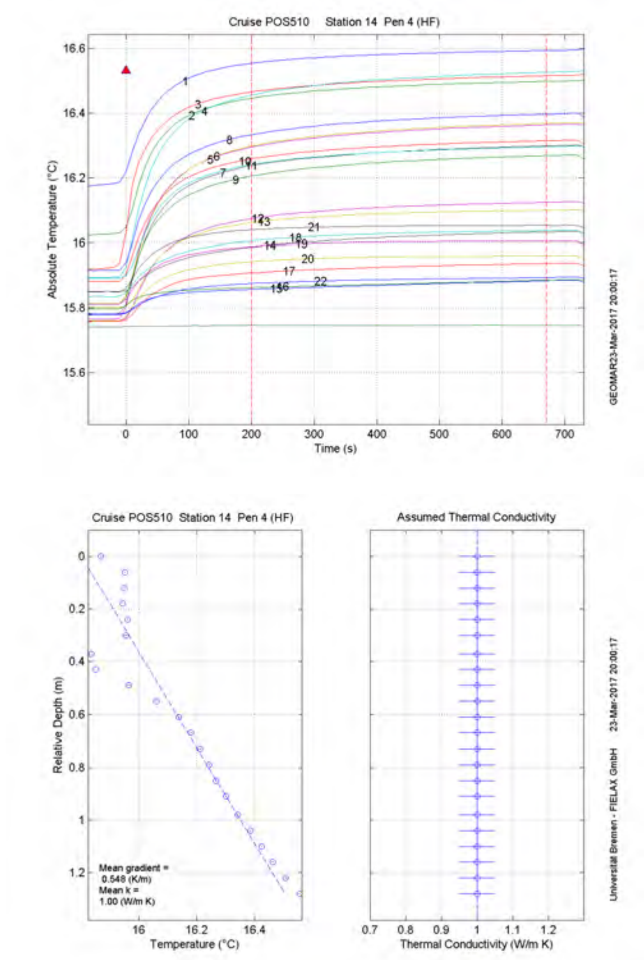
Station H1714P1



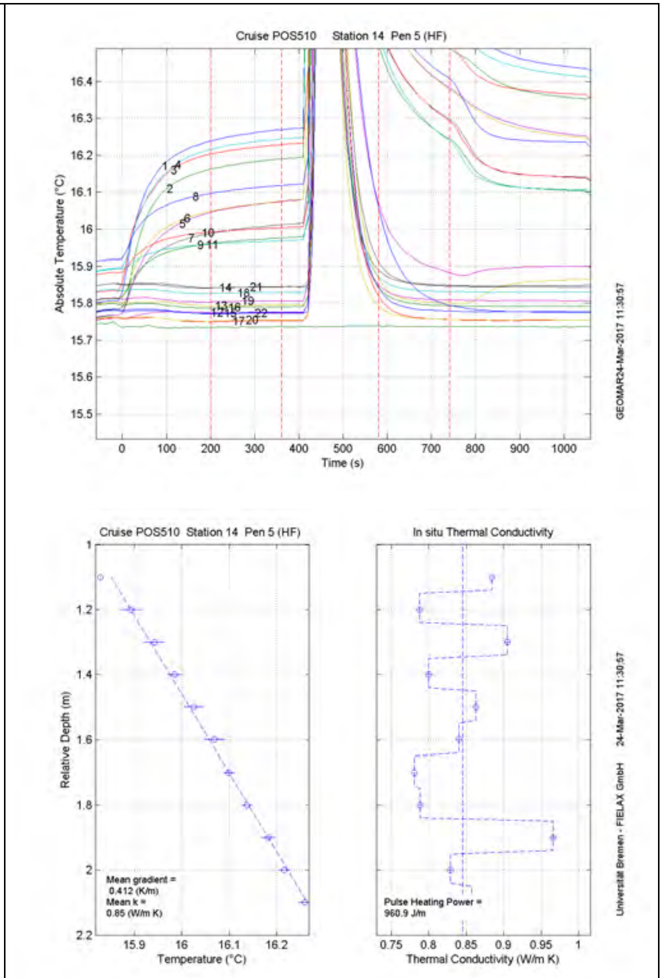
Station H1714P2



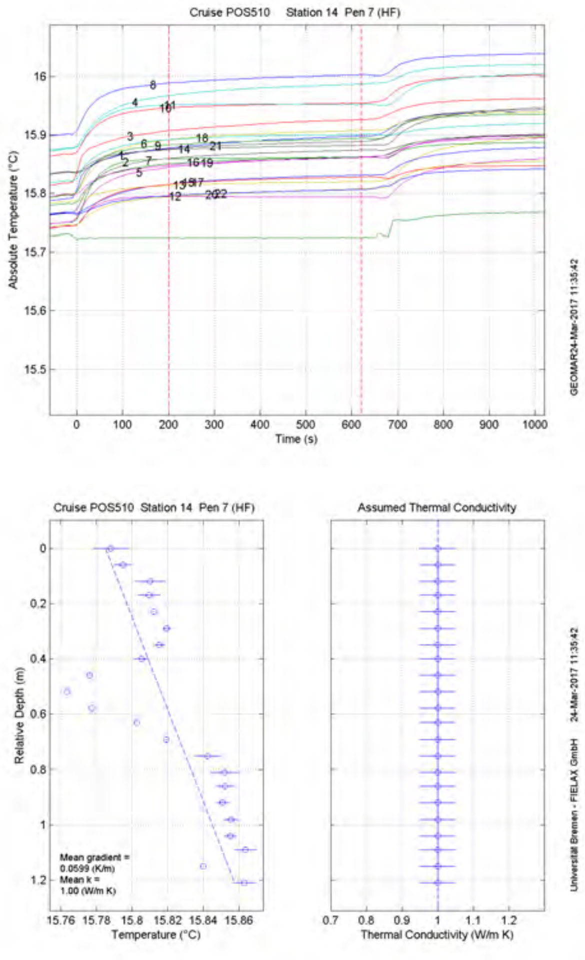
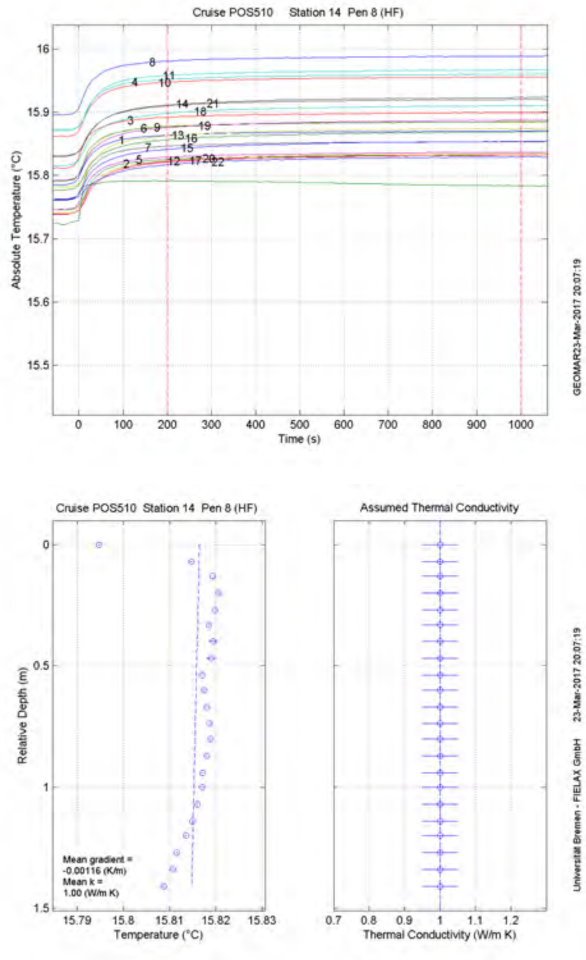
Station H1714P3

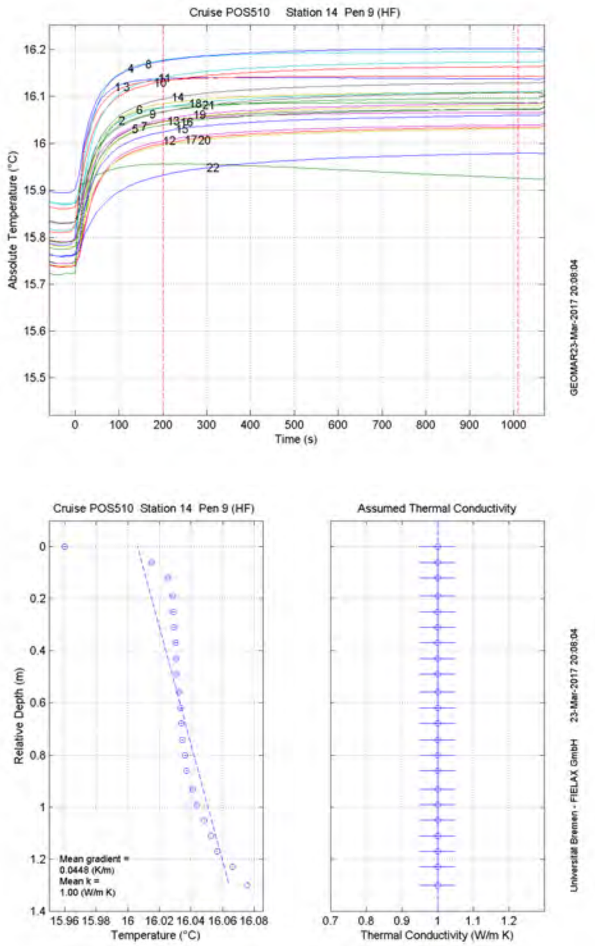


Station H1714P4

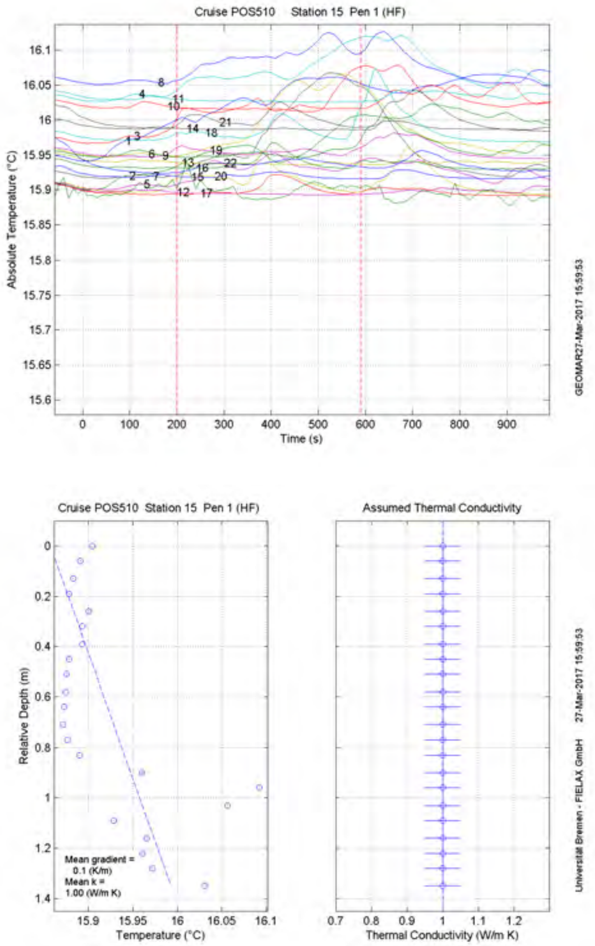


Station H1714P5

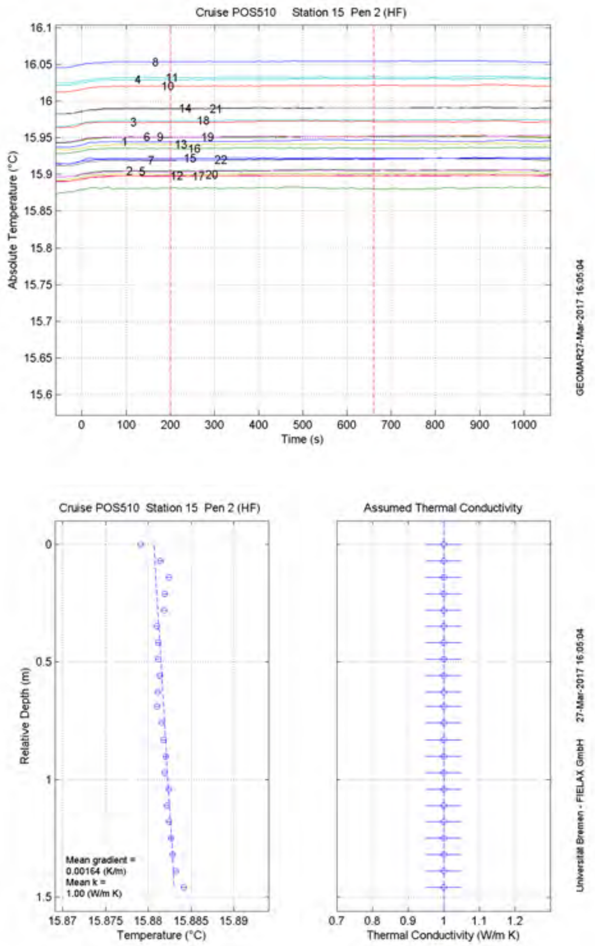
no penetration Station H1714P6	 Station H1714P7	 Station H1714P8



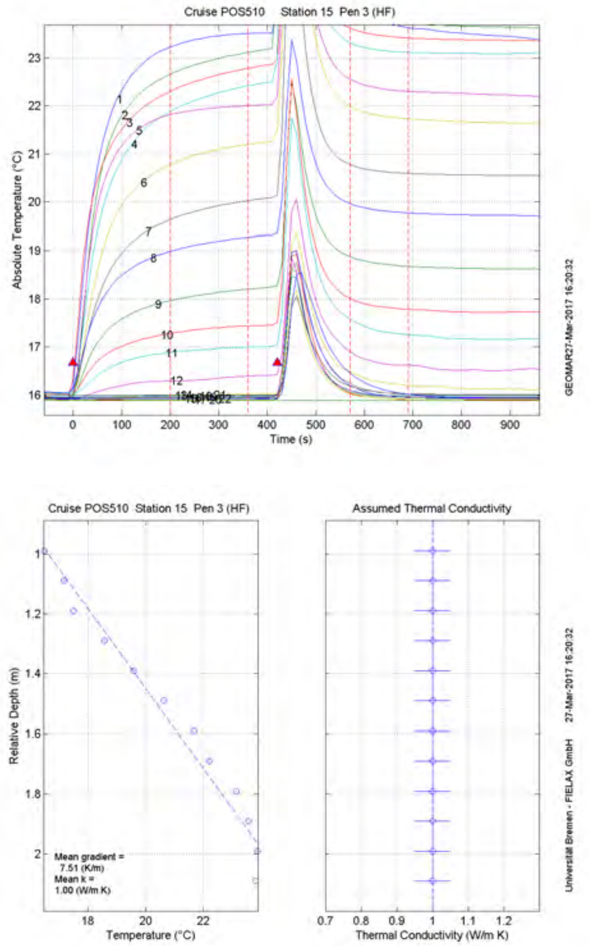
Station H1714P9



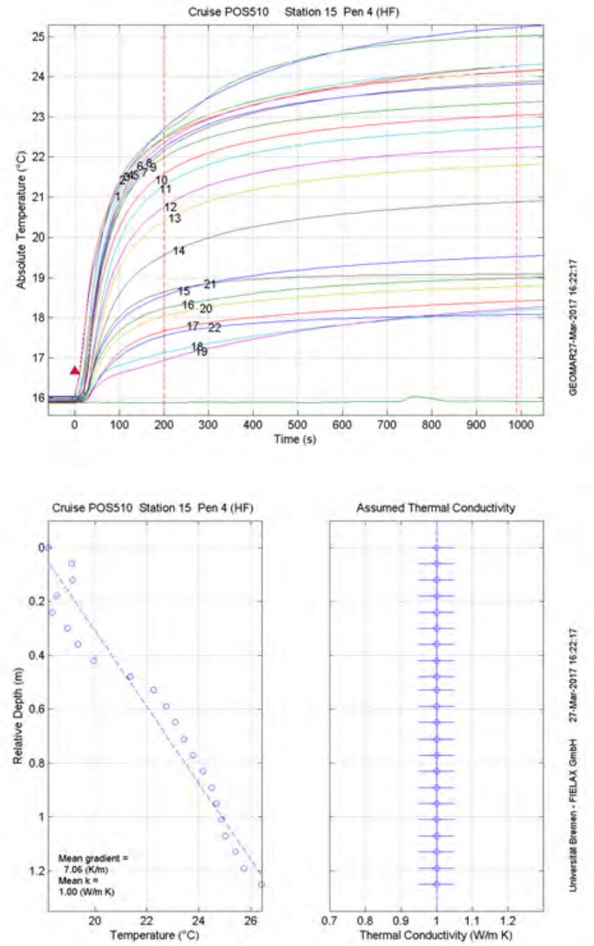
Station H1715P1



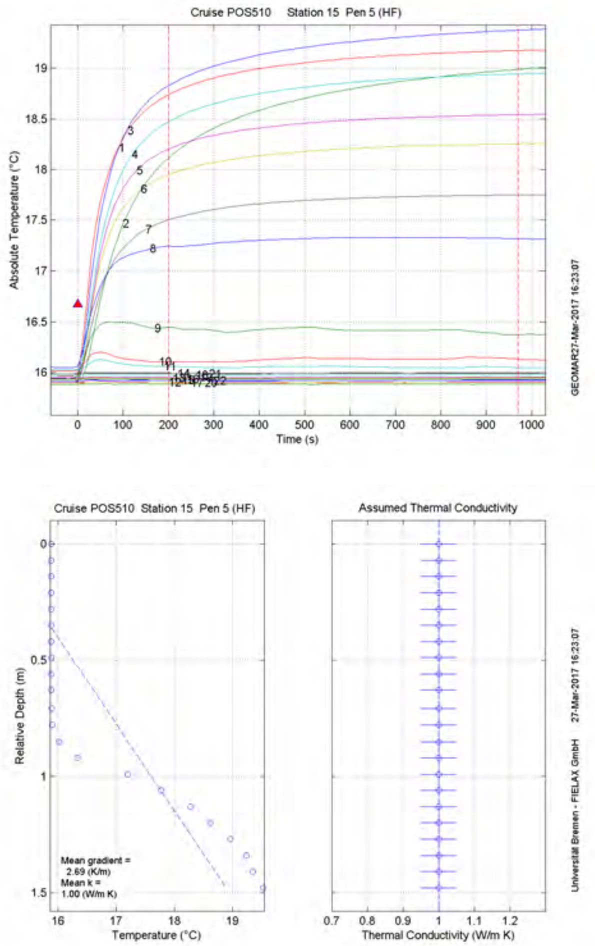
Station H1715P2



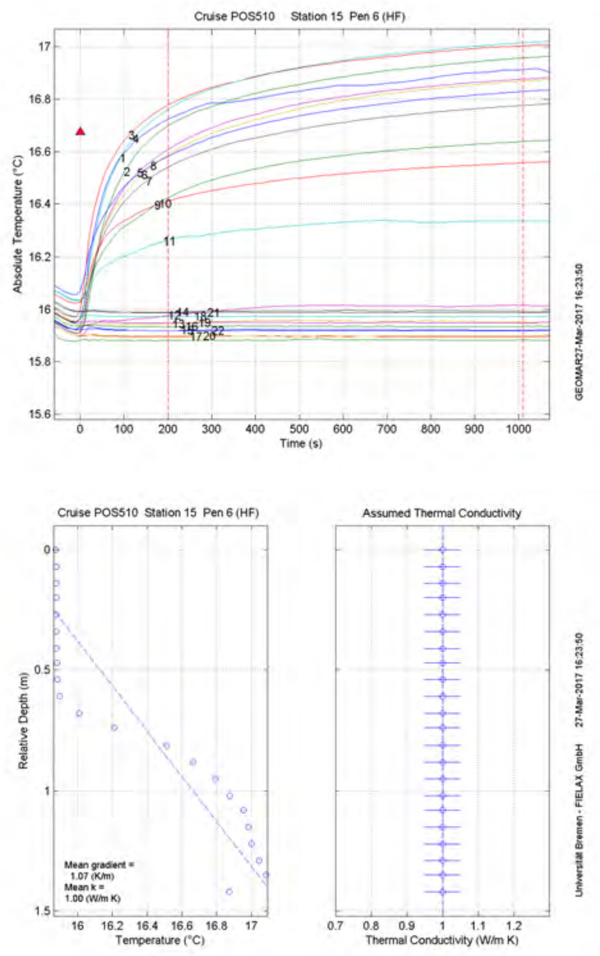
Station H1715P3



Station H1715P4



Station H1715P5



Station H1715P6

Cruise-Transect	POS510
Station	H1706
Penetration_No.	01
Date/Time_of_Pen.	2017-03-09 06:15:20
Tilt[∞]	51.8
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	0.0355
Q[mW/m^2]	35.461

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.300	15.575	1.300	1.000
2	1.240	15.582	1.240	1.000
3	1.170	15.587	1.170	1.000
4	1.110	15.569	1.110	1.000
5	1.050	15.558	1.050	1.000
6	0.990	15.566	0.990	1.000
7	0.930	15.547	0.930	1.000
8	0.870	15.555	0.870	1.000
9	0.800	15.553	0.800	1.000
10	0.740	15.556	0.740	1.000
11	0.680	15.528	0.680	1.000
12	0.620	15.524	0.620	1.000
13	0.560	15.523	0.560	1.000
14	0.490	15.545	0.490	1.000
15	0.430	15.540	0.430	1.000
16	0.370	15.536	0.370	1.000
17	0.310	15.529	0.310	1.000
18	0.250	15.538	0.250	1.000
19	0.190	15.541	0.190	1.000
20	0.120	15.527	0.120	1.000
21	0.060	15.537	0.060	1.000
22	0.000	15.546	0.000	1.000

Cruise-Transect	POS510
Station	H1706
Penetration_No.	02
Date/Time_of_Pen.	2017-03-09 07:34:02
Tilt[∞]	55.0
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	-0.013
Q[mW/m^2]	-13.036

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.210	15.525	1.210	1.000
2	1.150	15.517	1.150	1.000
3	1.090	15.532	1.090	1.000
4	1.030	15.524	1.030	1.000
5	0.980	15.513	0.980	1.000
6	0.920	15.528	0.920	1.000
7	0.860	15.531	0.860	1.000
8	0.800	15.567	0.800	1.000
9	0.750	15.572	0.750	1.000
10	0.690	15.566	0.690	1.000
11	0.630	15.545	0.630	1.000
12	0.570	15.551	0.570	1.000
13	0.520	15.547	0.520	1.000
14	0.460	15.553	0.460	1.000
15	0.400	15.546	0.400	1.000
16	0.340	15.540	0.340	1.000
17	0.290	15.525	0.290	1.000
18	0.230	15.522	0.230	1.000
19	0.170	15.531	0.170	1.000
20	0.110	15.525	0.110	1.000
21	0.060	15.539	0.060	1.000
22	0.000	15.575	0.000	1.000

Cruise-Transect	POS510
Station	H1706
Penetration_No.	03
Date/Time_of_Pen.	2017-03-09 08:44:08
Tilt[∞]	58.6
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	0.037
Q[mW/m^2]	36.423

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.090	15.553	1.090	1.000
2	1.040	15.561	1.040	1.000
3	0.990	15.569	0.990	1.000
4	0.940	15.552	0.940	1.000
5	0.890	15.544	0.890	1.000
6	0.830	15.555	0.830	1.000
7	0.780	15.544	0.780	1.000
8	0.730	15.553	0.730	1.000
9	0.680	15.551	0.680	1.000
10	0.620	15.557	0.620	1.000
11	0.570	15.529	0.570	1.000
12	0.520	15.525	0.520	1.000
13	0.470	15.519	0.470	1.000
14	0.420	15.541	0.420	1.000
15	0.360	15.532	0.360	1.000
16	0.310	15.528	0.310	1.000
17	0.260	15.523	0.260	1.000
18	0.210	15.533	0.210	1.000
19	0.160	15.531	0.160	1.000
20	0.100	15.517	0.100	1.000
21	0.050	15.524	0.050	1.000
22	0.000	15.527	0.000	1.000

Cruise-Transect	POS510
Station	H1706
Penetration_No.	04
Date/Time_of_Pen.	2017-03-09 10:31:55
Tilt[∞]	59.0
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	0.014
Q[mW/m^2]	14.036

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.080	15.635	1.080	1.000
2	1.030	15.638	1.030	1.000
3	0.980	15.650	0.980	1.000
4	0.930	15.632	0.930	1.000
5	0.880	15.625	0.880	1.000
6	0.820	15.638	0.820	1.000
7	0.770	15.627	0.770	1.000
8	0.720	15.637	0.720	1.000
9	0.670	15.636	0.670	1.000
10	0.620	15.644	0.620	1.000
11	0.570	15.617	0.570	1.000
12	0.510	15.616	0.510	1.000
13	0.460	15.614	0.460	1.000
14	0.410	15.636	0.410	1.000
15	0.360	15.630	0.360	1.000
16	0.310	15.626	0.310	1.000
17	0.260	15.618	0.260	1.000
18	0.210	15.628	0.210	1.000
19	0.150	15.630	0.150	1.000
20	0.100	15.615	0.100	1.000
21	0.050	15.625	0.050	1.000
22	0.000	15.631	0.000	1.000

Cruise-Transect POS510
Station 06
Penetration_No. 05
Date/Time_of_Pen. 2017-03-09 11:47:50
Tilt[∞] 4.8
HeatingPower[J/m] 849.71
k_mean[W/m K] 1.00
dT/dz[K/m] 0.00789
Q[mW/m^2] 7.888

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu

Cruise-Transect POS510
Station H1707
Penetration_No. 01
Date/Time_of_Pen. 2017-03-11 07:22:56
Tilt[∞] 8.9
HeatingPower[J/m] 1195.80
k_mean[W/m K] 0.89
dT/dz[K/m] 0.114
Q[mW/m^2] 97.071

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	2.070	16.238	2.408	0.845
2	1.980	16.237	2.301	0.829
3	1.880	16.235	2.180	0.826
4	1.780	16.210	2.058	0.821
5	1.680	16.197	1.939	0.861
6	1.580	16.196	1.824	0.864
7	1.480	16.175	1.709	0.881
8	1.380	16.177	1.598	0.917
9	1.280	16.162	1.487	0.891
10	1.190	16.158	1.386	0.884
11	1.090	16.112	1.268	0.829
12	0.990	16.099	1.148	0.831
13	0.890	16.084	1.027	0.826
14	0.790	16.095	0.907	0.837
15	0.690	16.080	0.789	0.854
16	0.590	16.070	0.674	0.889
17	0.490	16.069	0.562	0.896
18	0.400	16.077	0.457	0.824
19	0.300	16.065	0.335	0.818
20	0.200	16.029	0.209	0.764
21	0.100	16.017	0.088	0.891
22	0.000	16.005	0.000	1.691

Cruise-Transect	POS510
Station	H1707
Penetration_No.	02
Date/Time_of_Pen.	2017-03-11 08:10:12
Tilt[∞]	56.2
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	-0.00225
Q[mW/m^2]	-2.248

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.170	15.959	1.170	1.000
2	1.110	15.961	1.110	1.000
3	1.060	15.969	1.060	1.000
4	1.000	15.954	1.000	1.000
5	0.950	15.948	0.950	1.000
6	0.890	15.961	0.890	1.000
7	0.840	15.951	0.840	1.000
8	0.780	15.963	0.780	1.000
9	0.720	15.963	0.720	1.000
10	0.670	15.971	0.670	1.000
11	0.610	15.945	0.610	1.000
12	0.560	15.945	0.560	1.000
13	0.500	15.944	0.500	1.000
14	0.450	15.969	0.450	1.000
15	0.390	15.967	0.390	1.000
16	0.330	15.962	0.330	1.000
17	0.280	15.955	0.280	1.000
18	0.220	15.965	0.220	1.000
19	0.170	15.966	0.170	1.000
20	0.110	15.950	0.110	1.000
21	0.060	15.959	0.060	1.000
22	0.000	15.967	0.000	1.000

Cruise-Transect	POS510
Station	H1707
Penetration_No.	03
Date/Time_of_Pen.	2017-03-11 08:56:28
Tilt[∞]	1.2
HeatingPower[J/m]	1210.52
k_mean[W/m K]	0.83
dT/dz[K/m]	0.0817
Q[mW/m^2]	62.475

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	2.100	16.132	2.703	0.836
2	2.000	16.132	2.583	0.827
3	1.900	16.130	2.461	0.815
4	1.800	16.095	2.335	0.763
5	1.700	16.080	2.204	0.768
6	1.600	16.083	2.074	0.770
7	1.500	16.065	1.945	0.773
8	1.400	16.071	1.817	0.792
9	1.300	16.069	1.689	0.775
10	1.200	16.068	1.558	0.743
11	1.100	16.025	1.423	0.741
12	1.000	16.008	1.289	0.756
13	0.900	15.997	1.157	0.763
14	0.800	16.012	1.027	0.765
15	0.700	16.002	0.896	0.771
16	0.600	15.993	0.765	0.756
17	0.500	15.981	0.632	0.747
18	0.400	15.988	0.498	0.742
19	0.300	15.987	0.362	0.731
20	0.200	15.972	0.225	0.718
21	0.100	15.977	0.092	0.788
22	0.000	15.977	0.000	2.022

Cruise-Transect	POS510
Station	H1707
Penetration_No.	04
Date/Time_of_Pen.	2017-03-11 10:32:03
Tilt[∞]	50.8
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	15.2
Q[mW/m^2]	14819.858

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.330	53.151	1.330	1.000
2	1.260	53.565	1.260	1.000
3	1.200	53.510	1.200	1.000
4	1.140	52.874	1.140	1.000
5	1.070	52.029	1.070	1.000
6	1.010	51.094	1.010	1.000
7	0.950	50.060	0.950	1.000
8	0.880	49.130	0.880	1.000
9	0.820	48.202	0.820	1.000
10	0.760	46.885	0.760	1.000
11	0.700	45.482	0.700	1.000
12	0.630	44.316	0.630	1.000
13	0.570	43.236	0.570	1.000
14	0.510	41.466	0.510	1.000
15	0.440	39.985	0.440	1.000
16	0.380	39.072	0.380	1.000
17	0.320	39.717	0.320	1.000
18	0.250	40.670	0.250	1.000
19	0.190	40.945	0.190	1.000
20	0.130	39.004	0.130	1.000
21	0.060	36.034	0.060	1.000
22	0.000	31.233	0.000	1.000

Cruise-Transect	POS510
Station	H1707
Penetration_No.	05

no calculation possible

Cruise-Transect	POS510
Station	H1707
Penetration_No.	06
Date/Time_of_Pen.	2017-03-11 11:51:15
Tilt[∞]	50.8
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	0.15
Q[mW/m^2]	158.740

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.330	16.476	1.330	1.000
2	1.260	16.509	1.260	1.000
3	1.200	16.524	1.200	1.000
4	1.140	16.501	1.140	1.000
5	1.070	16.482	1.070	1.000
6	1.010	16.447	1.010	1.000
7	0.950	16.353	0.950	1.000
8	0.890	16.303	0.890	1.000
9	0.820	16.359	0.820	1.000
10	0.760	16.402	0.760	1.000
11	0.700	16.401	0.700	1.000
12	0.630	16.403	0.630	1.000
13	0.570	16.385	0.570	1.000
14	0.510	16.392	0.510	1.000
15	0.440	16.365	0.440	1.000
16	0.380	16.353	0.380	1.000
17	0.320	16.367	0.320	1.000
18	0.250	16.400	0.250	1.000
19	0.190	16.364	0.190	1.000
20	0.130	16.313	0.130	1.000
21	0.060	16.290	0.060	1.000
22	0.000	16.206	0.000	1.000

Cruise-Transect	POS510
Station	H1707
Penetration_No.	07
Date/Time_of_Pen.	2017-03-11 12:41:48
Tilt[∞]	51.1
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	0.162
Q[mW/m^2]	162.327

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.320	16.337	1.320	1.000
2	1.250	16.332	1.250	1.000
3	1.190	16.331	1.190	1.000
4	1.130	16.299	1.130	1.000
5	1.070	16.275	1.070	1.000
6	1.000	16.274	1.000	1.000
7	0.940	16.260	0.940	1.000
8	0.880	16.263	0.880	1.000
9	0.820	16.253	0.820	1.000
10	0.750	16.250	0.750	1.000
11	0.690	16.214	0.690	1.000
12	0.630	16.204	0.630	1.000
13	0.560	16.193	0.560	1.000
14	0.500	16.206	0.500	1.000
15	0.440	16.192	0.440	1.000
16	0.380	16.180	0.380	1.000
17	0.310	16.164	0.310	1.000
18	0.250	16.167	0.250	1.000
19	0.190	16.162	0.190	1.000
20	0.130	16.141	0.130	1.000
21	0.060	16.139	0.060	1.000
22	0.000	16.107	0.000	1.000

Cruise-Transect	POS510
Station	H1708
Penetration_No.	01
Date/Time_of_Pen.	2017-03-13 06:12:59
Tilt[∞]	58.0
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	0.021
Q[mW/m^2]	21.038

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.110	15.630	1.110	1.000
2	1.060	15.643	1.060	1.000
3	1.010	15.649	1.010	1.000
4	0.950	15.629	0.950	1.000
5	0.900	15.622	0.900	1.000
6	0.850	15.631	0.850	1.000
7	0.800	15.618	0.800	1.000
8	0.740	15.628	0.740	1.000
9	0.690	15.632	0.690	1.000
10	0.640	15.641	0.640	1.000
11	0.580	15.615	0.580	1.000
12	0.530	15.612	0.530	1.000
13	0.480	15.608	0.480	1.000
14	0.420	15.630	0.420	1.000
15	0.370	15.624	0.370	1.000
16	0.320	15.620	0.320	1.000
17	0.270	15.607	0.270	1.000
18	0.210	15.616	0.210	1.000
19	0.160	15.619	0.160	1.000
20	0.110	15.605	0.110	1.000
21	0.050	15.616	0.050	1.000
22	0.000	15.626	0.000	1.000

Cruise-Transect	POS510
Station	H1708
Penetration_No.	02
Date/Time_of_Pen.	2017-03-13 07:53:05
Tilt[∞]	51.6
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	0.00744
Q[mW/m^2]	7.445

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.300	15.233	1.300	1.000
2	1.240	15.243	1.240	1.000
3	1.180	15.254	1.180	1.000
4	1.120	15.237	1.120	1.000
5	1.060	15.230	1.060	1.000
6	0.990	15.239	0.990	1.000
7	0.930	15.227	0.930	1.000
8	0.870	15.239	0.870	1.000
9	0.810	15.243	0.810	1.000
10	0.750	15.251	0.750	1.000
11	0.680	15.225	0.680	1.000
12	0.620	15.224	0.620	1.000
13	0.560	15.222	0.560	1.000
14	0.500	15.244	0.500	1.000
15	0.430	15.239	0.430	1.000
16	0.370	15.235	0.370	1.000
17	0.310	15.223	0.310	1.000
18	0.250	15.233	0.250	1.000
19	0.190	15.236	0.190	1.000
20	0.120	15.222	0.120	1.000
21	0.060	15.232	0.060	1.000
22	0.000	15.238	0.000	1.000

Cruise-Transect	POS510
Station	H1708
Penetration_No.	03
Date/Time_of_Pen.	2017-03-13 07:53:05

Cruise-Transect	POS510
Station	H1708
Penetration_No.	04
Date/Time_of_Pen.	2017-03-13 11:53:42
Tilt[∞]	33.6
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	-0.0768
Q[mW/m^2]	-76.829

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.750	15.073	1.750	1.000
2	1.670	15.092	1.670	1.000
3	1.580	15.119	1.580	1.000
4	1.500	15.118	1.500	1.000
5	1.420	15.127	1.420	1.000
6	1.330	15.148	1.330	1.000
7	1.250	15.150	1.250	1.000
8	1.170	15.174	1.170	1.000
9	1.080	15.188	1.080	1.000
10	1.000	15.207	1.000	1.000
11	0.920	15.190	0.920	1.000
12	0.830	15.193	0.830	1.000
13	0.750	15.198	0.750	1.000
14	0.670	15.223	0.670	1.000
15	0.580	15.218	0.580	1.000
16	0.500	15.214	0.500	1.000
17	0.420	15.202	0.420	1.000
18	0.330	15.214	0.330	1.000
19	0.250	15.222	0.250	1.000
20	0.170	15.206	0.170	1.000
21	0.080	15.214	0.080	1.000
22	0.000	15.226	0.000	1.000

Cruise-Transect	POS510
Station	H1709
Penetration_No.	01
Date/Time_of_Pen.	2017-03-15 08:03:52
Tilt[∞]	2.3
HeatingPower[J/m]	1099.20
k_mean[W/m K]	0.58
dT/dz[K/m]	2.44
Q[mW/m^2]	1304.603

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	2.100	23.399	3.532	0.618
2	2.000	23.307	3.372	0.636
3	1.900	23.187	3.217	0.660
4	1.800	23.019	3.062	0.622
5	1.700	22.851	2.896	0.579
6	1.600	22.674	2.719	0.553
7	1.500	22.480	2.539	0.555
8	1.400	22.280	2.360	0.564
9	1.300	22.054	2.180	0.544
10	1.200	21.814	1.992	0.517
11	1.100	21.558	1.800	0.527
12	1.000	21.306	1.610	0.527
13	0.900	21.050	1.420	0.528
14	0.800	20.804	1.230	0.525
15	0.700	20.529	1.043	0.544
16	0.600	20.239	0.859	0.540
17	0.500	19.935	0.672	0.529
18	0.400	19.626	0.487	0.558
19	0.300	19.299	0.312	0.589
20	0.200	18.947	0.146	0.615
21	0.100	18.458	0.000	0.800

Cruise-Transect	POS510
Station	H1709
Penetration_No.	02
Date/Time_of_Pen.	2017-03-15 08:51:29
Tilt[∞]	2.1
HeatingPower[J/m]	1090.36
k_mean[W/m K]	0.66
dT/dz[K/m]	2.32
Q[mW/m^2]	1495.572

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	2.100	21.748	3.078	0.593
2	2.000	21.561	2.914	0.640
3	1.900	21.325	2.757	0.627
4	1.800	21.114	2.602	0.674
5	1.700	20.925	2.461	0.752
6	1.600	20.694	2.335	0.852
7	1.500	20.486	2.215	0.807
8	1.400	20.219	2.080	0.677
9	1.300	19.967	1.917	0.551
10	1.200	19.758	1.740	0.580
11	1.100	19.541	1.580	0.694
12	1.000	19.275	1.426	0.602
13	0.900	19.009	1.251	0.537
14	0.800	18.825	1.079	0.622
15	0.700	18.569	0.918	0.623
16	0.600	18.327	0.757	0.616
17	0.500	18.081	0.594	0.607
18	0.400	17.875	0.434	0.651
19	0.300	17.641	0.284	0.682
20	0.200	17.392	0.138	0.691
21	0.100	17.141	0.000	0.773

Cruise-Transect	POS510
Station	H1709
Penetration_No.	03
Date/Time_of_Pen.	2017-03-15 10:33:57
Tilt[∞]	51.9
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	1.32
Q[mW/m^2]	1162.899

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.290	20.806	1.290	1.000
2	1.230	20.542	1.230	1.000
3	1.170	20.259	1.170	1.000
4	1.110	19.793	1.110	1.000
5	1.050	19.551	1.050	1.000
6	0.990	19.432	0.990	1.000
7	0.920	19.413	0.920	1.000
8	0.860	19.326	0.860	1.000
9	0.800	19.203	0.800	1.000
10	0.740	19.210	0.740	1.000
11	0.680	19.005	0.680	1.000
12	0.620	19.135	0.620	1.000
13	0.550	19.123	0.550	1.000
14	0.490	19.138	0.490	1.000
15	0.430	19.060	0.430	1.000
16	0.370	19.098	0.370	1.000
17	0.310	18.909	0.310	1.000
18	0.250	18.657	0.250	1.000
19	0.180	18.852	0.180	1.000
20	0.120	18.719	0.120	1.000
21	0.060	18.990	0.060	1.000
22	0.000	18.355	0.000	1.000

Cruise-Transect	POS510
Station	H1709
Penetration_No.	04
Date/Time_of_Pen.	2017-03-15 11:17:10
Tilt[∞]	0.1
HeatingPower[J/m]	1068.89
k_mean[W/m K]	0.93
dT/dz[K/m]	0.556
Q[mW/m^2]	505.935

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	2.100	16.136	0.222	0.843
2	2.000	16.047	0.105	0.869
3	1.900	16.024	0.000	1.076

Cruise-Transect	POS510
Station	H1709
Penetration_No.	05
Date/Time_of_Pen.	2017-03-15 12:05:25
Tilt[∞]	52.0
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	0.231
Q[mW/m^2]	231.381

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.290	16.181	1.290	1.000
2	1.230	16.175	1.230	1.000
3	1.170	16.176	1.170	1.000
4	1.110	16.166	1.110	1.000
5	1.050	16.109	1.050	1.000
6	0.980	16.077	0.980	1.000
7	0.920	16.051	0.920	1.000
8	0.860	16.034	0.860	1.000
9	0.800	16.018	0.800	1.000
10	0.740	16.003	0.740	1.000
11	0.680	15.969	0.680	1.000
12	0.620	15.955	0.620	1.000
13	0.550	15.951	0.550	1.000
14	0.490	15.955	0.490	1.000
15	0.430	15.933	0.430	1.000
16	0.370	15.931	0.370	1.000
17	0.310	15.920	0.310	1.000
18	0.250	15.922	0.250	1.000
19	0.180	15.921	0.180	1.000
20	0.120	15.904	0.120	1.000
21	0.060	15.912	0.060	1.000
22	0.000	15.918	0.000	1.000

Cruise-Transect	POS510
Station	H1709
Penetration_No.	06
Date/Time_of_Pen.	2017-03-15 12:58:01
Tilt[∞]	5.0
HeatingPower[J/m]	1055.97
k_mean[W/m K]	1.21
dT/dz[K/m]	0.607
Q[mW/m^2]	675.377

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	2.090	16.123	0.180	0.950
2	1.990	16.052	0.080	1.058
3	1.890	16.002	0.000	1.630

Cruise-Transect	POS510
Station	H1709
Penetration_No.	07
Date/Time_of_Pen.	2017-03-15 14:12:38
Tilt[∞]	54.6
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	0.0493
Q[mW/m^2]	49.340

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.220	15.976	1.220	1.000
2	1.160	15.980	1.160	1.000
3	1.100	15.986	1.100	1.000
4	1.040	15.964	1.040	1.000
5	0.980	15.953	0.980	1.000
6	0.930	15.974	0.930	1.000
7	0.870	15.946	0.870	1.000
8	0.810	15.953	0.810	1.000
9	0.750	15.950	0.750	1.000
10	0.690	15.955	0.690	1.000
11	0.640	15.927	0.640	1.000
12	0.580	15.925	0.580	1.000
13	0.520	15.925	0.520	1.000
14	0.460	15.943	0.460	1.000
15	0.410	15.935	0.410	1.000
16	0.350	15.933	0.350	1.000
17	0.290	15.926	0.290	1.000
18	0.230	15.934	0.230	1.000
19	0.170	15.936	0.170	1.000
20	0.120	15.922	0.120	1.000
21	0.060	15.929	0.060	1.000
22	0.000	15.909	0.000	1.000

Cruise-Transect	POS510
Station	H1710
Penetration_No.	01
Date/Time_of_Pen.	2017-03-16 06:12:20
Tilt[∞]	55.5
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	-0.00213
Q[mW/m^2]	-2.132

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.190	15.326	1.190	1.000
2	1.130	15.343	1.130	1.000
3	1.080	15.358	1.080	1.000
4	1.020	15.340	1.020	1.000
5	0.960	15.334	0.960	1.000
6	0.910	15.344	0.910	1.000
7	0.850	15.334	0.850	1.000
8	0.790	15.346	0.790	1.000
9	0.740	15.345	0.740	1.000
10	0.680	15.353	0.680	1.000
11	0.620	15.327	0.620	1.000
12	0.570	15.327	0.570	1.000
13	0.510	15.327	0.510	1.000
14	0.450	15.349	0.450	1.000
15	0.400	15.344	0.400	1.000
16	0.340	15.341	0.340	1.000
17	0.280	15.332	0.280	1.000
18	0.230	15.339	0.230	1.000
19	0.170	15.343	0.170	1.000
20	0.110	15.331	0.110	1.000
21	0.060	15.343	0.060	1.000
22	0.000	15.360	0.000	1.000

Cruise-Transect	POS510
Station	H1710
Penetration_No.	02
Date/Time_of_Pen.	2017-03-16 07:31:44
Tilt[∞]	54.2
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	-0.0476
Q[mW/m^2]	-42.777

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.230	15.299	1.230	1.000
2	1.170	15.311	1.170	1.000
3	1.110	15.324	1.110	1.000
4	1.050	15.310	1.050	1.000
5	0.990	15.307	0.990	1.000
6	0.940	15.319	0.940	1.000
7	0.880	15.310	0.880	1.000
8	0.820	15.324	0.820	1.000
9	0.760	15.324	0.760	1.000
10	0.700	15.334	0.700	1.000
11	0.640	15.308	0.640	1.000
12	0.580	15.308	0.580	1.000
13	0.530	15.309	0.530	1.000
14	0.470	15.335	0.470	1.000
15	0.410	15.337	0.410	1.000
16	0.350	15.340	0.350	1.000
17	0.290	15.342	0.290	1.000
18	0.230	15.354	0.230	1.000
19	0.180	15.358	0.180	1.000
20	0.120	15.343	0.120	1.000
21	0.060	15.360	0.060	1.000
22	0.000	15.382	0.000	1.000

Cruise-Transect	POS510
Station	H1710
Penetration_No.	03
Date/Time_of_Pen.	2017-03-16 08:36:00
Tilt[∞]	57.4
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	0.00755
Q[mW/m^2]	7.549

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.130	15.365	1.130	1.000
2	1.080	15.372	1.080	1.000
3	1.020	15.384	1.020	1.000
4	0.970	15.367	0.970	1.000
5	0.920	15.361	0.920	1.000
6	0.860	15.371	0.860	1.000
7	0.810	15.361	0.810	1.000
8	0.750	15.372	0.750	1.000
9	0.700	15.370	0.700	1.000
10	0.650	15.378	0.650	1.000
11	0.590	15.351	0.590	1.000
12	0.540	15.349	0.540	1.000
13	0.490	15.349	0.490	1.000
14	0.430	15.371	0.430	1.000
15	0.380	15.365	0.380	1.000
16	0.320	15.362	0.320	1.000
17	0.270	15.354	0.270	1.000
18	0.220	15.363	0.220	1.000
19	0.160	15.367	0.160	1.000
20	0.110	15.354	0.110	1.000
21	0.050	15.367	0.050	1.000
22	0.000	15.373	0.000	1.000

Cruise-Transect	POS510
Station	H1710
Penetration_No.	04
Date/Time_of_Pen.	2017-03-16 10:19:40
Tilt[∞]	54.0
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	-0.0525
Q[mW/m^2]	-53.304

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.230	15.339	1.170	1.000
2	1.180	15.344	1.120	1.000
3	1.120	15.349	1.060	1.000
4	1.060	15.330	1.000	1.000
5	1.000	15.327	0.940	1.000
6	0.940	15.338	0.880	1.000
7	0.880	15.330	0.820	1.000
8	0.820	15.346	0.760	1.000
9	0.760	15.358	0.700	1.000
10	0.710	15.394	0.650	1.000
11	0.650	15.385	0.590	1.000
12	0.590	15.385	0.530	1.000
13	0.530	15.384	0.470	1.000
14	0.470	15.399	0.410	1.000
15	0.410	15.390	0.350	1.000
16	0.350	15.377	0.290	1.000
17	0.290	15.367	0.230	1.000
18	0.240	15.384	0.180	1.000
19	0.180	15.386	0.120	1.000
20	0.120	15.379	0.060	1.000
21	0.060	15.390	0.000	1.000

Cruise-Transect	POS510
Station	H1710
Penetration_No.	05
Date/Time_of_Pen.	2017-03-16 11:32:10
Tilt[∞]	53.3
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	-0.00503
Q[mW/m^2]	-5.027

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.250	15.340	1.190	1.000
2	1.200	15.350	1.140	1.000
3	1.140	15.362	1.080	1.000
4	1.080	15.349	1.020	1.000
5	1.020	15.343	0.960	1.000
6	0.960	15.352	0.900	1.000
7	0.900	15.339	0.840	1.000
8	0.840	15.352	0.780	1.000
9	0.780	15.354	0.720	1.000
10	0.720	15.363	0.660	1.000
11	0.660	15.333	0.600	1.000
12	0.600	15.334	0.540	1.000
13	0.540	15.335	0.480	1.000
14	0.480	15.360	0.420	1.000
15	0.420	15.355	0.360	1.000
16	0.360	15.352	0.300	1.000
17	0.300	15.345	0.240	1.000
18	0.240	15.357	0.180	1.000
19	0.180	15.360	0.120	1.000
20	0.120	15.346	0.060	1.000
21	0.060	15.360	0.000	1.000

Cruise-Transect	POS510
Station	H1710
Penetration_No.	06
Date/Time_of_Pen.	2017-03-16 12:33:47
Tilt[∞]	54.3
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	0.0197
Q[mW/m^2]	19.668

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.220	15.294	1.160	1.000
2	1.170	15.306	1.110	1.000
3	1.110	15.319	1.050	1.000
4	1.050	15.308	0.990	1.000
5	0.990	15.301	0.930	1.000
6	0.930	15.314	0.870	1.000
7	0.870	15.307	0.810	1.000
8	0.820	15.325	0.760	1.000
9	0.760	15.324	0.700	1.000
10	0.700	15.332	0.640	1.000
11	0.640	15.306	0.580	1.000
12	0.580	15.306	0.520	1.000
13	0.520	15.287	0.460	1.000
14	0.470	15.291	0.410	1.000
15	0.410	15.276	0.350	1.000
16	0.350	15.277	0.290	1.000
17	0.290	15.270	0.230	1.000
18	0.230	15.289	0.170	1.000
19	0.170	15.290	0.110	1.000
20	0.120	15.298	0.060	1.000
21	0.060	15.319	0.000	1.000

Cruise-Transect	POS510
Station	H1711
Penetration_No.	01
Date/Time_of_Pen.	2017-03-19 13:11:17
Tilt[∞]	11.2
HeatingPower[J/m]	1019.71
k_mean[W/m K]	1.12
dT/dz[K/m]	-0.0543
Q[mW/m^2]	-59.677

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	2.060	15.191	0.878	1.094
2	1.960	15.191	0.784	1.029
3	1.860	15.190	0.689	1.091
4	1.770	15.187	0.608	1.114
5	1.670	15.183	0.519	1.146
6	1.570	15.178	0.431	1.130
7	1.470	15.181	0.339	1.042
8	1.370	15.203	0.246	1.121
9	1.280	15.197	0.168	1.173
10	1.180	15.234	0.083	1.190
11	1.080	15.263	0.000	1.216

Cruise-Transect	POS510
Station	H1711
Penetration_No.	02
Date/Time_of_Pen.	2017-03-19 14:39:49
Tilt[∞]	54.9
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	-0.144
Q[mW/m^2]	-143.750

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.210	14.829	0.810	1.000
2	1.150	14.834	0.750	1.000
3	1.090	14.839	0.690	1.000
4	1.040	14.842	0.640	1.000
5	0.980	14.848	0.580	1.000
6	0.920	14.856	0.520	1.000
7	0.860	14.873	0.460	1.000
8	0.810	14.884	0.410	1.000
9	0.750	14.892	0.350	1.000
10	0.690	14.898	0.290	1.000
11	0.630	14.904	0.230	1.000
12	0.580	14.913	0.180	1.000
13	0.520	14.922	0.120	1.000
14	0.460	14.933	0.060	1.000
15	0.400	14.937	0.000	1.000

Cruise-Transect	POS510
Station	H1712
Penetration_No.	01
Date/Time_of_Pen.	2017-03-21 08:20:37
Tilt[∞]	56.1
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	-0.0168
Q[mW/m^2]	-17.763

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.170	14.786	1.170	1.000
2	1.120	14.775	1.120	1.000
3	1.060	14.786	1.060	1.000
4	1.000	14.786	1.000	1.000
5	0.950	14.785	0.950	1.000
6	0.890	14.786	0.890	1.000
7	0.840	14.790	0.840	1.000
8	0.780	14.805	0.780	1.000
9	0.720	14.822	0.720	1.000
10	0.670	14.830	0.670	1.000
11	0.610	14.821	0.610	1.000
12	0.560	14.818	0.560	1.000
13	0.500	14.807	0.500	1.000
14	0.450	14.806	0.450	1.000
15	0.390	14.807	0.390	1.000
16	0.330	14.805	0.330	1.000
17	0.280	14.803	0.280	1.000
18	0.220	14.807	0.220	1.000
19	0.170	14.807	0.170	1.000
20	0.110	14.807	0.110	1.000
21	0.060	14.802	0.060	1.000
22	0.000	14.786	0.000	1.000

Cruise-Transect	POS510
Station	H1712
Penetration_No.	02
Date/Time_of_Pen.	2017-03-21 10:26:00
Tilt[∞]	50.1
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	0.0132
Q[mW/m^2]	9.947

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.350	14.989	1.350	1.000
2	1.280	14.976	1.280	1.000
3	1.220	14.977	1.220	1.000
4	1.150	14.987	1.150	1.000
5	1.090	14.992	1.090	1.000
6	1.030	14.989	1.030	1.000
7	0.960	14.988	0.960	1.000
8	0.900	14.978	0.900	1.000
9	0.830	14.976	0.830	1.000
10	0.770	14.974	0.770	1.000
11	0.710	14.971	0.710	1.000
12	0.640	14.972	0.640	1.000
13	0.580	14.971	0.580	1.000
14	0.510	14.971	0.510	1.000
15	0.450	14.971	0.450	1.000
16	0.380	14.971	0.380	1.000
17	0.320	14.971	0.320	1.000
18	0.260	14.977	0.260	1.000
19	0.190	14.979	0.190	1.000
20	0.130	14.980	0.130	1.000
21	0.060	14.972	0.060	1.000
22	0.000	14.953	0.000	1.000

Cruise-Transect	POS510
Station	H1712
Penetration_No.	03
Date/Time_of_Pen.	2017-03-21 10:49:10
Tilt[∞]	58.3
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	-0.01
Q[mW/m^2]	-15.809

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.100	14.952	1.100	1.000
2	1.050	14.952	1.050	1.000
3	1.000	14.956	1.000	1.000
4	0.950	14.959	0.950	1.000
5	0.890	14.962	0.890	1.000
6	0.840	14.963	0.840	1.000
7	0.790	14.965	0.790	1.000
8	0.740	14.966	0.740	1.000
9	0.680	14.967	0.680	1.000
10	0.630	14.967	0.630	1.000
11	0.580	14.969	0.580	1.000
12	0.530	14.971	0.530	1.000
13	0.470	14.968	0.470	1.000
14	0.420	14.969	0.420	1.000
15	0.370	14.970	0.370	1.000
16	0.320	14.970	0.320	1.000
17	0.260	14.969	0.260	1.000
18	0.210	14.972	0.210	1.000
19	0.160	14.972	0.160	1.000
20	0.110	14.972	0.110	1.000
21	0.050	14.967	0.050	1.000
22	0.000	14.949	0.000	1.000

Cruise-Transect	POS510
Station	H1713
Penetration_No.	01
Date/Time_of_Pen.	2017-03-22 13:17:40
Tilt[∞]	14.3
HeatingPower[J/m]	994.65
k_mean[W/m K]	1.06
dT/dz[K/m]	0.054
Q[mW/m^2]	55.681

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	2.030	15.416	0.465	1.105
2	1.940	15.417	0.378	0.966
3	1.840	15.397	0.278	1.019
4	1.740	15.399	0.179	1.015
5	1.650	15.391	0.091	1.020
6	1.550	15.395	0.000	1.219

Cruise-Transect	POS510
Station	H1713
Penetration_No.	02
Date/Time_of_Pen.	2017-03-22 13:43:23
Tilt[∞]	6.3
HeatingPower[J/m]	985.27
k_mean[W/m K]	1.30
dT/dz[K/m]	0.0503
Q[mW/m^2]	62.740

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	2.090	15.420	0.242	1.119
2	1.990	15.408	0.155	1.193
3	1.890	15.407	0.072	1.215
4	1.790	15.403	0.000	1.673

Cruise-Transect	POS510
Station	H1714
Penetration_No.	01
Date/Time_of_Pen.	2017-03-23 07:04:47
Tilt[∞]	1.6
HeatingPower[J/m]	968.77
k_mean[W/m K]	0.99
dT/dz[K/m]	-0.125
Q[mW/m^2]	-125.085

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	2.100	15.199	1.533	1.078
2	2.000	15.210	1.440	1.061
3	1.900	15.220	1.346	1.091
4	1.800	15.230	1.253	1.051
5	1.700	15.239	1.159	1.075
6	1.600	15.250	1.066	1.083
7	1.500	15.261	0.973	1.050
8	1.400	15.278	0.878	1.066
9	1.300	15.294	0.784	1.064
10	1.200	15.307	0.689	1.032
11	1.100	15.307	0.589	0.962
12	1.000	15.324	0.484	0.943
13	0.900	15.336	0.376	0.903
14	0.800	15.362	0.264	0.890
15	0.700	15.375	0.141	0.736
16	0.600	15.384	0.000	0.676

Cruise-Transect	POS510
Station	H1714
Penetration_No.	02
Date/Time_of_Pen.	2017-03-23 07:56:53
Tilt[∞]	48.5
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	-0.122
Q[mW/m^2]	-122.426

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.390	15.457	0.130	1.000
2	1.320	15.468	0.060	1.000
3	1.260	15.473	0.000	1.000

Cruise-Transect	POS510
Station	H1714
Penetration_No.	03
Date/Time_of_Pen.	2017-03-23 09:02:09
Tilt[∞]	52.1
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	1.82
Q[mW/m^2]	1612.594

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.290	20.175	1.290	1.000
2	1.230	19.918	1.230	1.000
3	1.170	19.543	1.170	1.000
4	1.110	18.985	1.110	1.000
5	1.040	18.560	1.040	1.000
6	0.980	18.418	0.980	1.000
7	0.920	18.125	0.920	1.000
8	0.860	17.938	0.860	1.000
9	0.800	17.861	0.800	1.000
10	0.740	17.785	0.740	1.000
11	0.680	17.673	0.680	1.000
12	0.610	17.603	0.610	1.000
13	0.550	17.608	0.550	1.000
14	0.490	17.629	0.490	1.000
15	0.430	17.642	0.430	1.000
16	0.370	17.657	0.370	1.000
17	0.310	17.658	0.310	1.000
18	0.250	17.641	0.250	1.000
19	0.180	17.620	0.180	1.000
20	0.120	17.582	0.120	1.000
21	0.060	17.438	0.060	1.000
22	0.000	16.876	0.000	1.000

Cruise-Transect	POS510
Station	H1714
Penetration_No.	04
Date/Time_of_Pen.	2017-03-23 10:40:57
Tilt[∞]	52.4
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	0.548
Q[mW/m^2]	518.902

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.280	16.553	1.280	1.000
2	1.220	16.506	1.220	1.000
3	1.160	16.461	1.160	1.000
4	1.100	16.422	1.100	1.000
5	1.040	16.384	1.040	1.000
6	0.980	16.341	0.980	1.000
7	0.910	16.300	0.910	1.000
8	0.850	16.266	0.850	1.000
9	0.790	16.242	0.790	1.000
10	0.730	16.211	0.730	1.000
11	0.670	16.180	0.670	1.000
12	0.610	16.138	0.610	1.000
13	0.550	16.060	0.550	1.000
14	0.490	15.965	0.490	1.000
15	0.430	15.852	0.430	1.000
16	0.370	15.837	0.370	1.000
17	0.300	15.955	0.300	1.000
18	0.240	15.961	0.240	1.000
19	0.180	15.945	0.180	1.000
20	0.120	15.951	0.120	1.000
21	0.060	15.953	0.060	1.000
22	0.000	15.871	0.000	1.000

Cruise-Transect	POS510
Station	H1714
Penetration_No.	05
Date/Time_of_Pen.	2017-03-23 11:26:18
Tilt[∞]	3.5
HeatingPower[J/m]	960.90
k_mean[W/m K]	0.85
dT/dz[K/m]	0.412
Q[mW/m^2]	332.118

Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	2.100	16.258	1.192	0.857
2	2.000	16.215	1.073	0.829
3	1.900	16.182	0.960	0.966
4	1.800	16.137	0.846	0.788
5	1.700	16.099	0.719	0.780
6	1.600	16.069	0.595	0.840
7	1.500	16.025	0.477	0.863
8	1.400	15.985	0.357	0.800
9	1.300	15.942	0.239	0.904
10	1.200	15.892	0.121	0.788
11	1.100	15.829	0.000	0.884

Cruise-Transect	POS510
Station	H1714
Penetration_No.	06
Date/Time_of_Pen.	2017-03-23 12:04

no penetration

Cruise-Transect	POS510				Cruise-Transect	POS510			
Station	H1714				Station	H1714			
Penetration_No.	07				Penetration_No.	08			
Date/Time_of_Pen.	2017-03-23 12:24:06				Date/Time_of_Pen.	2017-03-23 13:01:08			
Tilt[∞]	54.9				Tilt[∞]	48.0			
HeatingPower[J/m]	0.00				HeatingPower[J/m]	0.00			
k_ass[W/m K]	1.000				k_ass[W/m K]	1.000			
dT/dz[K/m]	0.0599				dT/dz[K/m]	-0.00116			
Q[mW/m^2]	57.851				Q[mW/m^2]	-5.796			
Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu	Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.210	15.863	1.210	1.000	1	1.410	15.809	1.410	1.000
2	1.150	15.840	1.150	1.000	2	1.340	15.811	1.340	1.000
3	1.090	15.863	1.090	1.000	3	1.270	15.812	1.270	1.000
4	1.040	15.855	1.040	1.000	4	1.200	15.814	1.200	1.000
5	0.980	15.855	0.980	1.000	5	1.140	15.815	1.140	1.000
6	0.920	15.851	0.920	1.000	6	1.070	15.816	1.070	1.000
7	0.860	15.852	0.860	1.000	7	1.000	15.817	1.000	1.000
8	0.810	15.852	0.810	1.000	8	0.940	15.817	0.940	1.000
9	0.750	15.842	0.750	1.000	9	0.870	15.818	0.870	1.000
10	0.690	15.819	0.690	1.000	10	0.800	15.819	0.800	1.000
11	0.630	15.803	0.630	1.000	11	0.740	15.819	0.740	1.000
12	0.580	15.777	0.580	1.000	12	0.670	15.818	0.670	1.000
13	0.520	15.764	0.520	1.000	13	0.600	15.817	0.600	1.000
14	0.460	15.776	0.460	1.000	14	0.540	15.817	0.540	1.000
15	0.400	15.805	0.400	1.000	15	0.470	15.819	0.470	1.000
16	0.350	15.815	0.350	1.000	16	0.400	15.819	0.400	1.000
17	0.290	15.819	0.290	1.000	17	0.330	15.819	0.330	1.000
18	0.230	15.812	0.230	1.000	18	0.270	15.820	0.270	1.000
19	0.170	15.810	0.170	1.000	19	0.200	15.821	0.200	1.000
20	0.120	15.810	0.120	1.000	20	0.130	15.819	0.130	1.000
21	0.060	15.795	0.060	1.000	21	0.070	15.815	0.070	1.000
22	0.000	15.788	0.000	1.000	22	0.000	15.795	0.000	1.000

Cruise-Transect	POS510
Station	H1714
Penetration_No.	09
Date/Time_of_Pen.	2017-03-23 13:38:40
Tilt[∞]	51.9
HeatingPower[J/m]	0.00
k_ass[W/m K]	1.000
dT/dz[K/m]	0.0448
Q[mW/m^2]	34.158

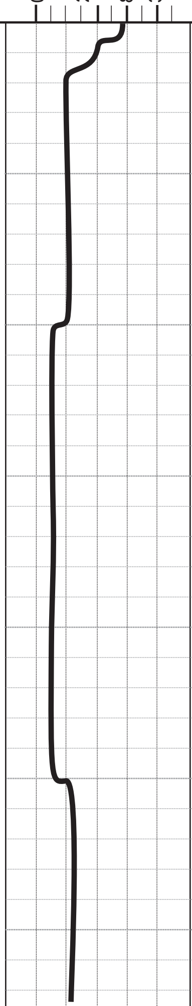
Sens_used	Sens_depth	T_insitu	Bull_depth	k_insitu
1	1.300	16.076	1.300	1.000
2	1.230	16.067	1.230	1.000
3	1.170	16.057	1.170	1.000
4	1.110	16.053	1.110	1.000
5	1.050	16.048	1.050	1.000
6	0.990	16.044	0.990	1.000
7	0.930	16.041	0.930	1.000
8	0.860	16.037	0.860	1.000
9	0.800	16.036	0.800	1.000
10	0.740	16.034	0.740	1.000
11	0.680	16.034	0.680	1.000
12	0.620	16.034	0.620	1.000
13	0.560	16.033	0.560	1.000
14	0.490	16.031	0.490	1.000
15	0.430	16.031	0.430	1.000
16	0.370	16.030	0.370	1.000
17	0.310	16.029	0.310	1.000
18	0.250	16.029	0.250	1.000
19	0.190	16.028	0.190	1.000
20	0.120	16.026	0.120	1.000
21	0.060	16.015	0.060	1.000
22	0.000	15.960	0.000	1.000

Appendix 5: Gravity Core Logs, Recovery Protocols, and Sample Lists

Core: POS510 - 03 GC Section: 1 of 1

Lat.: 39°31.58'N Long.: 25°29.22'E Recovery: 65 cm

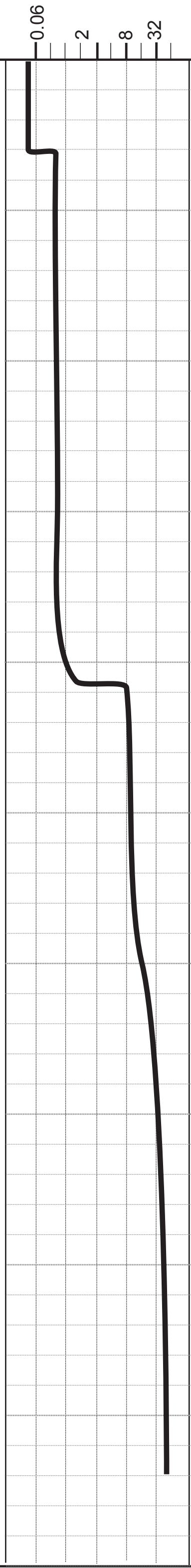
GEOMAR

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000		 					finegrained oxidised sediment overlaying coarse sand to gravel pumice clast (2cm) @005 cm	
010			pH=5.17;Eh=171	S^0		02	005-020cm: dark grey with reddish/orange tinge, silty to sandy	10
020							020-042/050cm: dark grey muddy material, dry, baked?	
030			dark grey (N3) pH=6.68;Eh=167			03		35
040							sharp contact at an angle 050-061cm: light grey silt, clay, anhydrite? fracture lining of anhydrite	
050			medium-blueish grey (5B ; 5/1)				061-065cm: dark grey, silty material, white clast with pyrite crystal (<1 mm)	55
060							core catcher: coarse grained material, with large anhydrite crystals?	
065							Tmax= 96°C	64

Core: POS510 - 04 GC   Section: 1 of 1

Lat.: 36°31.58' N   Long.: 25°29.18'E   Recovery: 94 cm

GEOMAR

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000			light brown (5YR/5/6) pH=6.25;Eh=146				000-007cm: iron oxide mud-silt orange brown, with slightly reddish layer, few small clasts (<2mm)	0-7
010			0.4Y/3.54/2.14 pH=5.98;Eh=52			04	007-030cm: olive-brown, wet sediment, silty	15-18
020						05		
030			olive grey (5Y/4/1) pH=5.99;Eh=15 6.1Y/3.20/1.60			06	030-043cm: olive grey silt, getting slightly coarser towards the bottom	35
040							big 9cm pumice clast @43cm (divided into WH and AH)	
050			light grey (N7)				042-094cm: coarse to very coarse gained (2mm- 4cm) pumice clasts, heterogenous clast content ranging from light to dark grey and whitish clasts, subangular-angular, getting coarser towards the bottom	
060								65-70
070						07	Tmax: 27-28°C	
080								
090								
094								

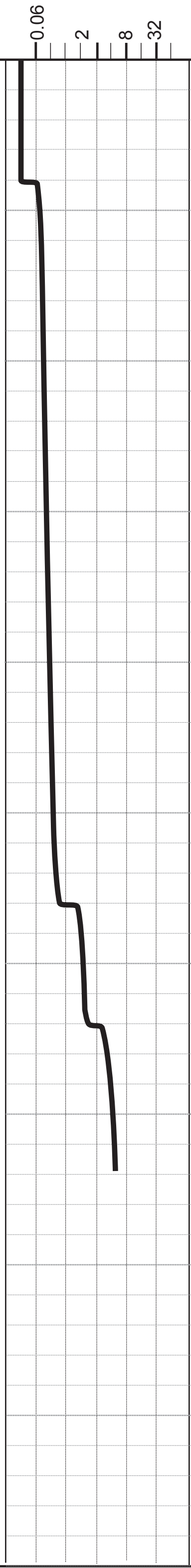
Core: POS510 - 05 GC Section: 1 of 2

Lat.: 36°31.38'N Long.: 25°29.10'E Recovery: 174 cm

GEOMAR

Core Photo

Grainsize (mm)



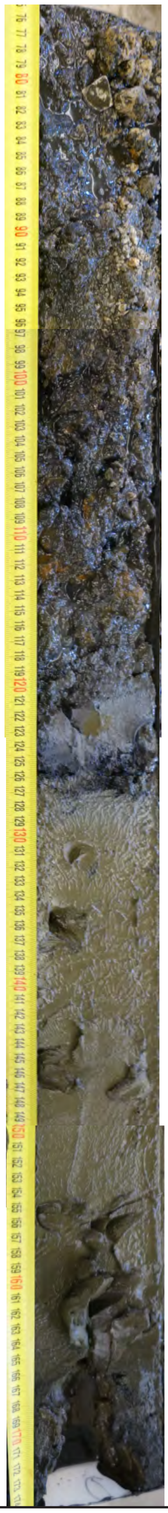
cm	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000					000-008cm: Fe-oxide rich brownish mud	
010						
	0.5Y/3.46/2.06 pH=7.06;Eh=-40			19	008-056cm: moderate olive brown to olive grey, wet mud-silt getting darker towards the bottom	15 ●●
020						
030						
	2.7Y/3.24/1.84					
040	pH=6.93;Eh=-110			20		40 ●
					@47cm: dark sulfide spot (2cm)	
050						
060	pH=6.98;Eh=-88			21	056-063cm: dark grey silt to fine sand with small pumice clasts (1mm), with an slight orange tinge	60
070	pH=6.96;Eh=-111 (in mud half)			22	063-073cm: brownish-olive mud with an orange tinge getting coarser towards the bottom, from 66cm downwards pumice clasts up to 0.5cm on one half of the core (with an angle), fluid sample (22) in the muddy part	70 ●●
073						

Core: POS510 - 05 GC Section: 2 of 2

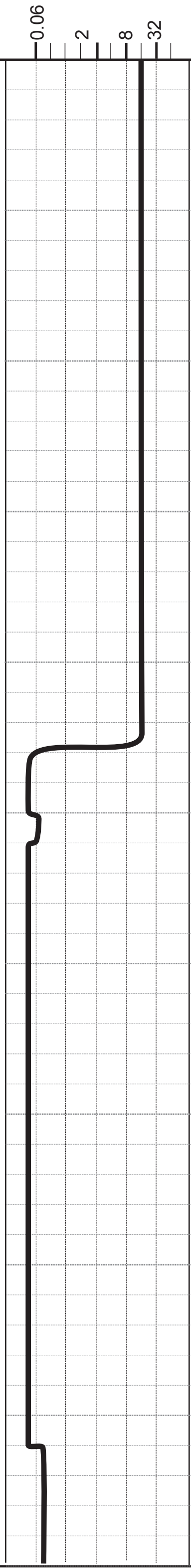
Lat.: 36°31.38'N Long.: 25°29.10'E Recovery: 174 cm

GEOMAR

Core Photo



Grainsize (mm)



Depth (cm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
074					075-120cm: to coarse grained pumice clasts and dark grey mud, clasts white to light grey mostly subangular (1cm-4cm), 100-120cm: orange-brown tinge	
084						
094						
	pH=6.98;Eh=-57					100
104						
				23		
114						
	@122cm: 2.2B/3.22/0.20 pH=7.17;Eh=-125			24	120-124cm: medium grey (N5) mud	●● 122
124	@125cm 7.3GY/2.26/0.19 pH=7.36;Eh=-220			25 27	124-126cm: black grey baked, compact mud, strong smell	125 126
	@127cm pH=6.80;Eh=-47					
134					126-166cm: olive grey mud	
	6.2Y/3.61/0.97					
144						
154						● ●
	7.8Y/2.84/1.22 pH=6.81;Eh=-76			26		160
164					166-175cm: dark olive grey with dark grey tinge mud-silt	
					core catcher: dark olive grey to brownish mud	
174						

Core: POS510 - 07 GC Section: 1 of 1

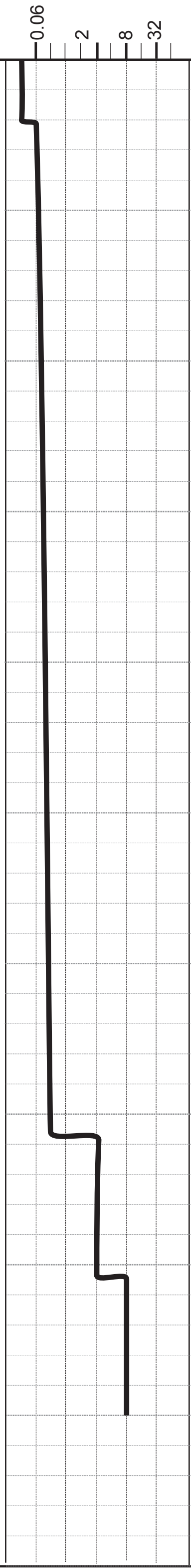
Poseidon-Station: POS510 - 06 GC (repeat of 06GC)

Lat.: 36°31.38'N Long.: 25°29.27'E Recovery: 90 cm

GEOMAR

Core Photo

Grainsize (mm)



Depth (cm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000	pH=6.98;Eh=121			08	000-004cm: Fe-oxide rich mud, orange-brown to olive grey	00-04
035					004-071cm: olive grey to brown silt, below 40cm getting darker and few black patches (sulfide spots?) up to 1cm in size	
043	4.0Y/2.46/2.48					
050	4.0Y/2.40/2.54 pH=6.82;Eh=84			09		50
070					sharp contact	
077				10	071-081cm: mixed volcaniclastic material with grey mud, pumice clasts 1-5mm	75-80
086				11	081-090cm: medium to coarse grained pumice, heterogenous clast content, color ranging from dark grey to white and light grey, subrounded-subangular 1mm-1.5cm in size	85-88
095					core catcher: huge pumice clast (12cm)	

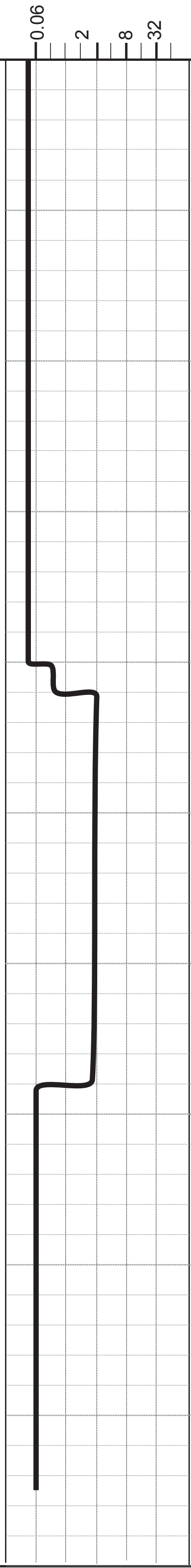
Depth scale (cm): 000, 010, 020, 030, 040, 050, 060, 070, 080, 090

Core: POS510 - 08 GC Section: 1 of 2

Poseidon-Station: POS510 - 07 GC

Lat.: 36°31.47'N Long.: 25°29.20'E Recovery: 195 cm

GEOMAR

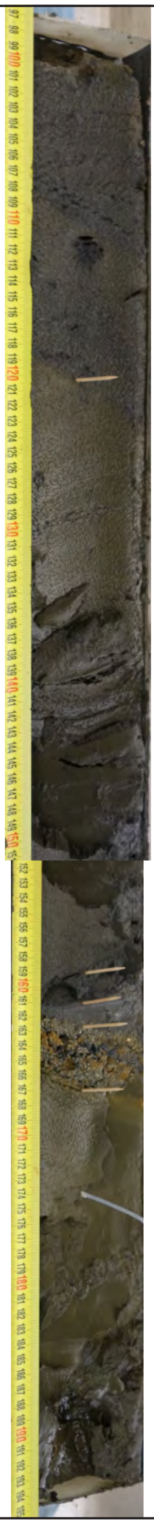
cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000			moderate olive brown (5Y/4/4)				000-040cm: moderate olive brown mud to silt, minor iron oxide content, orange tinge towards the top	
010								
020								
030			4.5Y/2.73/2.30 pH=6.81;Eh=-44			29		33
040			8.9Y/2.78/0.20 pH=6.99;Eh=-57			30	040-042cm: dark grey silt to fine sand, white pumice clasts (<1mm)	40
050			dark grey lense pH=6.95;Eh=-33			31	042-063cm: fine to medium grained volcaniclastic layer, mostly white to light grey pumice clasts, few slightly orange and dark grey clasts, dark grey mud as matrix	48-50
060						32	047-053cm: dark grey mud-silt lense, fluid sample (31) in dark lense	60
070							sharp contact at an angle	
							063-095cm: dark olive grey mud-silt, with few small black patches	
080			9.0Y/2.48/0.85 pH=6.77;Eh=-60			33		80 ●●
090								
095								

Core: POS510 - 08 GC Section: 2 of 2

Poseidon-Station: POS510 - 07 GC

Lat.: 36°31.47'N Long.: 25°29.20'E Recovery: 195 cm

GEOMAR

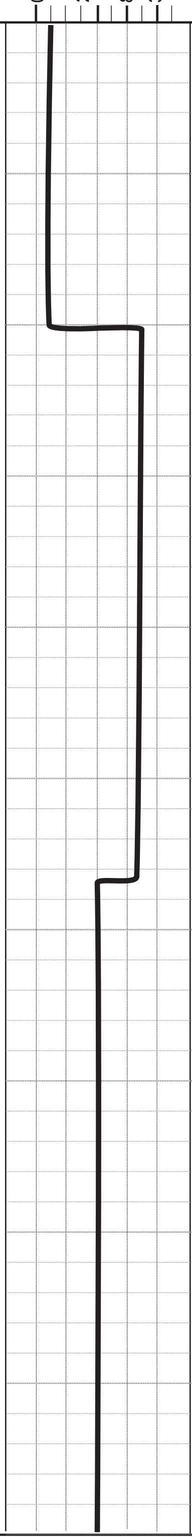
cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
095							095-120cm: dark olive grey mud-silt with black grey patches	
105								
115			8.8Y/2.50/0.68 pH=6.02			34		115 ●●
125							contact at an angle 120-159cm: medium olive grey mud to silt, getting darker towards the bottom, few black grey patches	
135			7.8Y/2.29/1.07 pH=6.69;Eh=-38			35		135 ●●
145								
155								
						36	159-162cm: med. grey to dark grey mud-silt with blackish schlieren	161
165			@161cm: 3.1GY/3.32/0.30 pH=6.7;Eh=-28			37 38	162-166cm: fine to medium grained volcaniclastic layer, with light grey pumice, orange tinge at top and bottom of layer	164
175			7.7Y/3.29/0.77 pH=6.72;Eh=-33			39	166-195cm: olive grey mud, with few darker patches, getting slightly darker towards the bottom	175 ●●
185							last 3 units with an low angle contact	
195			pH=7.07;Eh=52				Tmax: 15°C (pH=7.09;Eh=-129)	

Core: POS510 - 09 GC Section: 1 of 2

Poseidon-Station: POS510 - 08 GC

Lat.: 36°31.58'N Long.: 25°29.22'E Recovery: 193 cm

GEOMAR

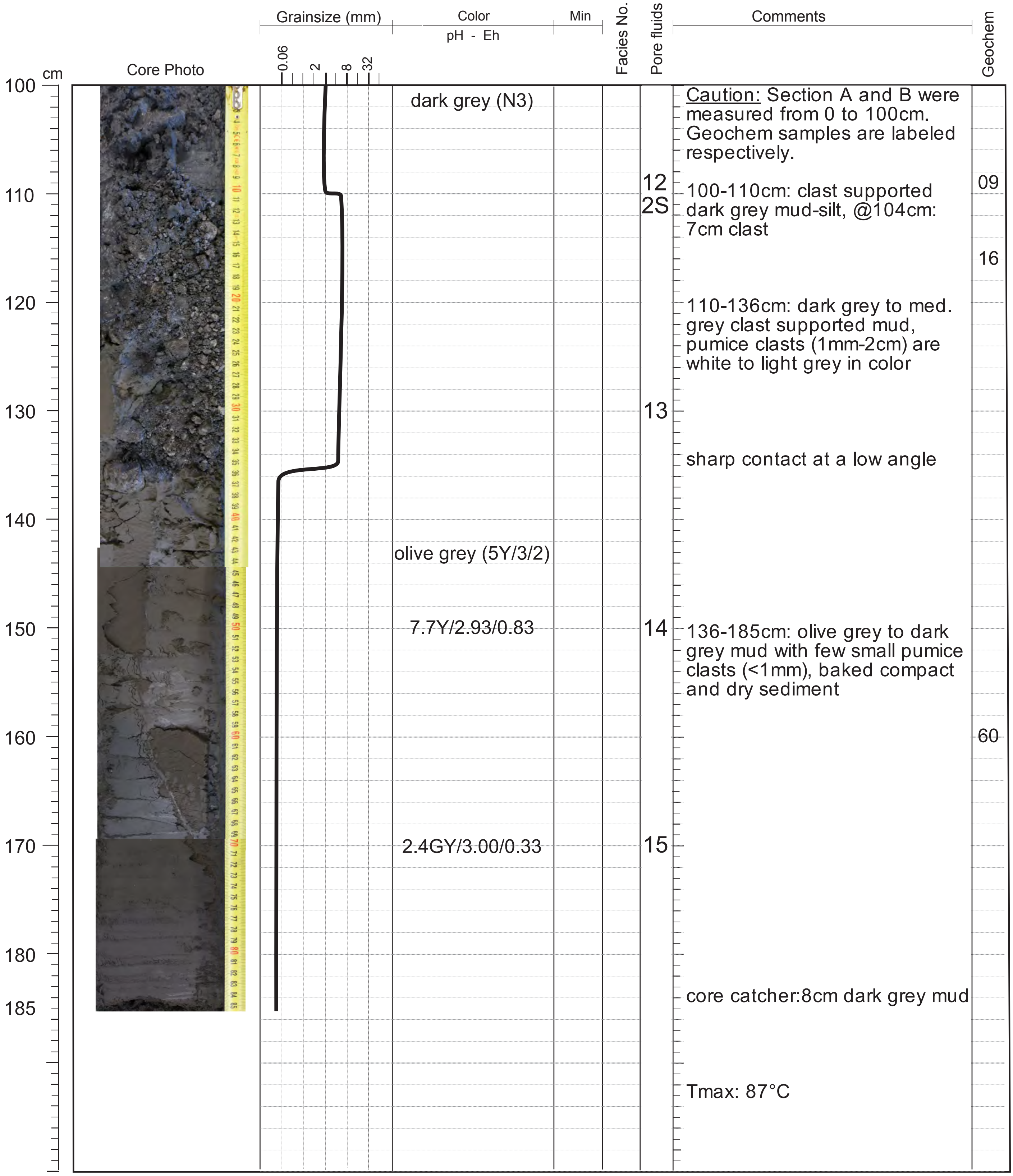
Depth (cm)	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000			dark green grey (5PY/4/1)				000-021cm: dark green grey sediment, silt to fine sand with pumice clasts, Fe-oxide?	
010						18		8-10
020								
030							021-057cm: medium to coarse grained (2mm-6cm) pumice layer, whitish to light grey pumice clasts	
040						17		40-42
050								
060			dark grey (N3)					
070							057-100cm: clast supported dark grey mud, wet sediment, heterogenous clasts size	
080						16		80-82
090			pH=6.39;Eh=144					
100							Tmax=57°C	

Grainsize scale: 0.06, 2, 8, 32

Core: POS510 - 09 GC Section: 2 of 2

Poseidon-Station: POS510 - 08 GC

Lat.: 36°31.58'N Long.: 25°29.22'E Recovery: 193 cm



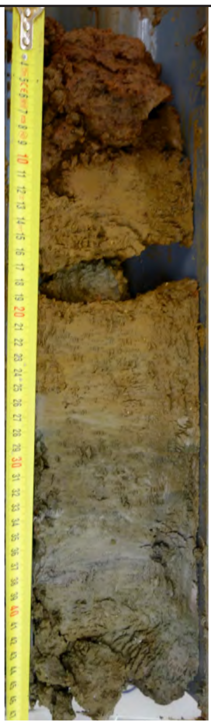
Core: POS510 - 13 GC Section: 1 of 1

Poseidon-Station: POS510 - 12 GC

Lat.: 36°27.01'N Long.: 25°24.10'E Recovery: 47 cm

GEOMAR

Core Photo



Grainsize (mm): 0.06, 2, 8, 32

cm	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000	moderate brown: (5YR/3/4) 5.9YR/3.49/1.16 ph=7.19;Eh=147	Mn?		42	000-009cm: reddish brown, Fe-oxide rich mud to silt with Fe-Mn-encrustation on the top 5cm, @5cm small (1mm) feeder	Mn: 0-5; 3-5
010	moderate yellow brown: (10YR/5/4) 9.9YR/3.16/3.09 ph=7.43;Eh=-42			43	009-024cm: yellow-brown silt, Fe-oxide staining, gradual transition from reddish brown to yellow brown on top and diffusiv layering of slightly more greyish layers towards the bottom	15 ●●
020						
030	olive grey: (5Y/4/1) 3.5Y/3.32/0.73 ph=7.69;Eh=152			44	024-032cm: diffusiv layering of yellow-brown to light grey and dark olive grey towards the bottom, overall material mud, few pumice clasts up 1.5cm	30 ●●
	medium grey:(N5) 6.8Y/3.24/1.12 ph=7.05;Eh=182			45	033-038cm: medium to light grey mud to silt with dark grey schlieren (@36-38cm) with greenish tinge	36
040	olive grey: (5Y/4/1) ph=6.44;Eh=-91			46	038-047cm: olive grey mud-silt with an orange brownish tinge	43-45
047						

Tmax: 16°C; pH=7.1, Eh=-98

Core: POS510 - 15 GC Section: 1 of 1

Poseidon-Station: POS510 - 13 GC

Lat.: 36°26.94'N Long.: 25°24.17'E Recovery: 100 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							Sec B: Core recovery containing Fe-rich silt- fine sand with Fe-Mn-encrustation	Mn: 0-30
010							000-038cm: Fe-oxide rich silty to sandy wed material, reddish-brown with Fe-Mn-encrustation, encrustation more pronounced in the first 10cm, few pumice clasts	
020			pH=6.8;Eh=147			48		20
030								
040			6.5YR/3.15/2.11 pH=7.00;Eh=136				038-078cm: layered silt with a color ranging from reddish-brown to orange and yellow-brown to olive grey 48-54cm: Fe-oxide rich layer with orange tinge on one half and olive grey tinges until 68cm mostly reddish-brown silt than yellow brown	42 ●●
050			@52cm (olive grey): pH=6.96;Eh=97 1.4Y/2.66/2.51 @52cm (orange): pH=6.99;Eh=78			49		51-52 ●●
060								
070			8.9YR/3.28/2.64 pH=6.99;Eh=86			50		70
080							078-100cm: coarse grained mixed volcanic hydrothermal material, heterogenous clast content: volcanic pumice, Fe-rich red clasts, Fe-(Mn)-crust, clasts vary from 1mm-0.5cm, from 80 to 90cm dark grey tinge than mostly brownish	
090			pH=7.03;Eh=106			51		90
100							Tmax=19°C	

Core: POS510 - 16 GC Section: 1 of 1

Poseidon-Station: POS510 - 14 GC

Lat.: 36°26.85'N Long.: 25°23.85'E Recovery: 42 cm

GEOMAR

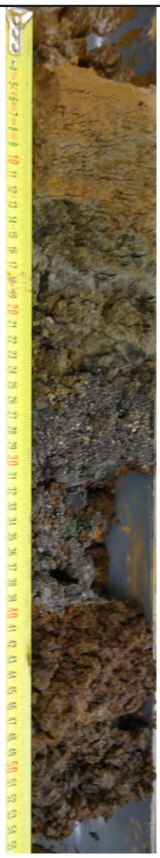
cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000			pH=7.42;Eh=91 moderate brown (5YR/4/4)				000-018cm: reddish brown silt to fine sand with dark grey to black patches, Fe-oxide rich	5-8
010							contact with an angle	
020			9.1YR/3.69/2.52 pH=7.23;Eh=-59 moderate yellowish brown (5YR/5/4)			52	018-037cm: mud with a minor silt component, until 25cm yellow-brown than half core yellow-brown and other half medium grey with darker schlieren, rarely single pumice clasts within layer	20
030			@37cm (medium grey half) 7.1Y/3.63/0.65 pH=7.19;Eh=45			53	fluid sample (53) within medium grey half; contact with an angle	35
040			olive grey (5Y/4/1) 1.9Y/4.00/0.89 pH=7.31;Eh=98			54	037-042cm: olive grey brown mud-silt few pumice clasts up to 1cm in size	40
042								

Core: POS510 - 17 GC-B Section: 1 of 1

Poseidon-Station: POS510 - 17 GC

Lat.: 36°27.01'N Long.: 25°24.44'E Recovery: 57 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-004cm: yellow-reddish brown silt with a darker tinges	
							004-012cm: yellow-brown mud, diffuse light to medium grey layers, few pumice clasts (3mm)	
010			pH=7.34;Eh=150 1.0Y/4.15/1.18			55		10 ●●
			4.0Y/3.44/1.21				012-025cm: first 3cm mixed volcaniclastic layer, olive black to yellow brown, followed by 2cm medium grey mud layer, than olive brown mud with few pieces of Mn-Fe-crust	
020			pH=7.60;Eh=145			56		20 ●●
030						57	025-040cm: very heterogenous mixed layer, pumice clasts, sand, in color ranging from red brown, med. to dark grey, sharp boundary with a lo angle light grey layer 1mm-thick at contact	30 36
040			pH=7.2;Eh=216				032-040cm: hydrothermal over-print? dark grey, green thin layer, Mn-crust and strong red patches	
			7.9YR/2.85/0.94 pH=7.41;Eh=162					47-50
050						58	040-057cm: reddish-brown Fe-oxide rich mud-silt with dark patches of Mn-Fe-crust	
057								

Core: POS510 - 18 GC Section: 1 of 3

Lat.: 36°27.20'N Long.: 25°24.46'E Recovery: 300 cm

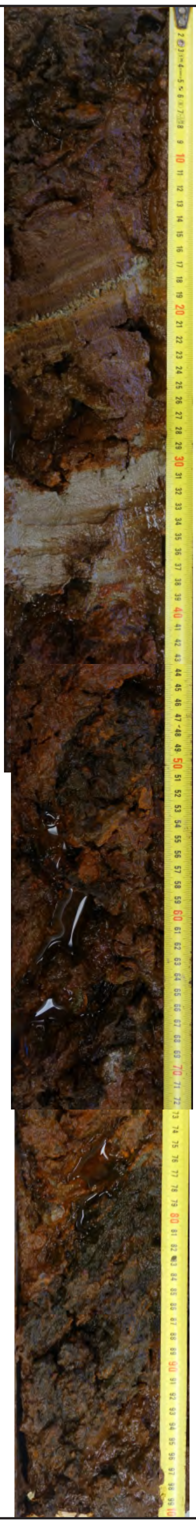
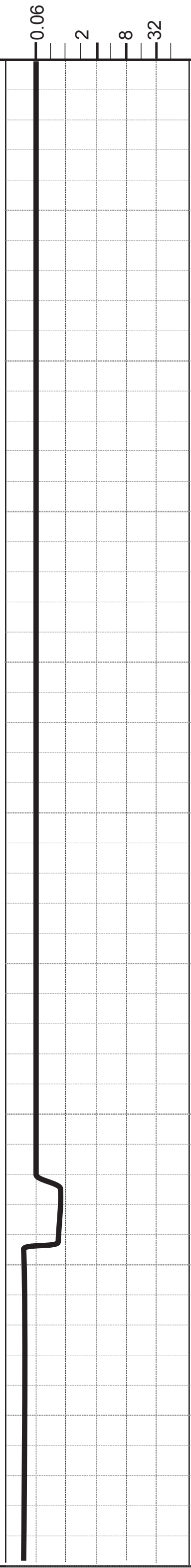
GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 / 2 / 8 / 32	Color pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							layered Fe-oxyhydroxides, crust with intercalated fine-grained Fe-rich mud, few intercalated thin greyish silty layers (mm-cm), some sections with thicker crust up to 2mm, alternation of dark brownish layers	
010			pH=6.46;Eh=77 5.6YR/2.42/3.22			59		10 ●●
020							18-20cm: olive-grey mud-silt	
030							40-53cm: few 0.5cm thick olive grey mud layers	
040			pH=6.2;Eh=70			60		40 ●●
050								
060							64-80cm: orange brown mud-silt, with few darker schlieren, from 75cm onwards more yellow-brown	
070			pH=6.38;Eh=97 3.5YR/3.3/2.66 pH=6.36;Eh=36 0.3Y/3.44/2.27			61		70 ●●
080						62	81-100cm: Fe-oxyhydroxides, mud with pervasive Fe-Mn-encrustation	
090			pH=6.92;Eh=107				*orange brown silt layer occurs often above light olive grey layer	90
100								

Core: POS510 - 18 GC Section: 2 of 3

Lat.: 36°27.20'N Long.: 25°24.46'E Recovery: 300 cm

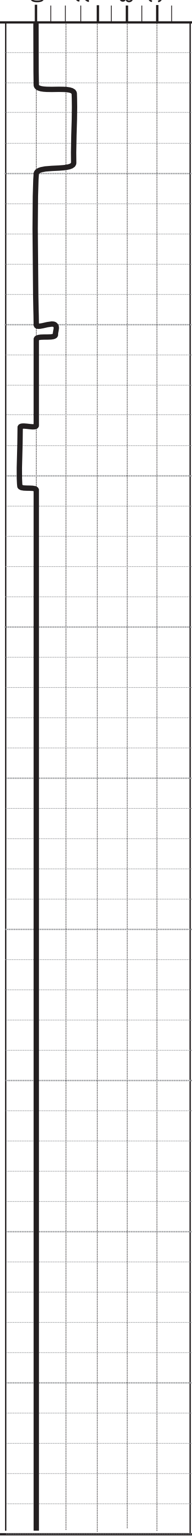
GEOMAR

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
100							layered Fe-(Mn)-oxyhydroxide crust (mm-0.5cm) intercalated dark brown to reddish brown layers layers are dipping with an low angle	
110			dusky brown (5YR/2/2)					
			pH=6.09;Eh=71			63		115 ●●
120							@119cm: grey silt layer with an angle, greyish layer above thin orange brown bed	
						64		125
130			pH=6.47;Eh=12 2.0Y/4.03/1.42			65	130-140cm: not continous 10cm thick light olive grey silt layer	133 ●●
140								
150							140-175cm: broken pieces of Fe-Mn-crust some pieces with 0.5cm thick crust	
160						66		160
170							@174cm: fine to medium sand layer, greyish layer followed by a orange-brown layer	
180						67	180-200cm: dusky brown mud with altered/soft Fe-Mn-crust	185
190			pH=6.12;Eh=49 9.0YR/3.28/0.72					
200							bottom temp. at section B: T=20°C	

Core: POS510 - 18 GC Section: 3 of 3

Lat.: 36°27.20'N Long.: 25°24.46'E Recovery: 300 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
200			pH=7.07;Eh=86 dusky brown (5YR/2/2)			69	dark brown silt with greyish tinge 204-210cm: medium to coarse mixed volcaniclastic material	205
210			moderate brown (5YR/3/4)				210-226cm: silt with broken pieces of Fe-Mn-crust	
220			@228cm: 3.3Y/2.76/0.70 pH=6.86;Eh=37			70	226-230cm: dark grey to black layer with a slight greenish tinge, mud	230 ●●
230			5.2YR/3.23/1.04				230-277cm: layered Fe-Mn-oxyhydroxide mm-cm thick layers, alternation of dark brown, yellow brown and greyish layers, with Fe-Mn-encrustation, partly altered, overall material silt	
240			pH=6.5;Eh=103			71		245 ●●
250							@241cm: 4cm long lense with medium grained volcaniclastic material	
260			pH=7.26;Eh=36			72	@269cm: light olive grey 1cm thick silt layer	265
270							277-288cm: with thicker Fe-Mn-crust	
280			pH=6.89;Eh=173			73	@283cm: thin 0.5cm thick dark black layer with green tinge, compact Mn-crust	280 ●●
290			light olive grey (5Y/6/1)				288-230cm: medium grey silt with few white small pumice clasts (<2mm)	290-295
300								

Core: POS510 - 20 GC Section: 1 of 3

Lat.: 36°27.21'N Long.: 25°24.15'E Recovery: 300 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000			moderate brown (5YR/4/4)				000-030cm: reddish brown mud with intercalated dark grey 0.5cm thick Fe-(Mn)-crusts often surrounded by a strong orange brown rim, crust is partly altered	
010			4.8Y/3.00/3.76 pH=6.51;Eh=149			74		10
020								
030							030-053cm: brown to dark brown mud (slightly silty) with pervasive Fe-(Mn)-encrustation mm-0.5cm thick crust, worm tubes on top of crust	30-crust
040								
050			pH=6.92;Eh=-109			75	thin greyish 0.5cm layer @54cm	50
060							053-090cm: strong reddish brown mud to silt with more orange layers. Thin (<1mm) layers of black crust with strong red rim.	
			pH=6.26;Eh=145			76		65-crust 65 ●●
070			4.6YR/2.61/5.14					
			pH=6.25;Eh=143				medium greyish silt layer ca.1cm thick @78cm with a low angle	
080						77		80
			moderate reddish brown (10R/4/6)				090-100cm: dark brown mud with dark to black Fe-Mn-crust olive brown and yellow-brown schlieren.	
090			2.9YR/3.25/2.27					
100			very dusky red (10R/2/2)				Bottom temperature at section C: T=18.5°C; pH=5.88; Eh=58	

Core: POS510 - 20 GC   Section: 2 of 3

Lat.: 36°27.21'N   Long.: 25°24.15'E   Recovery: 300 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 / 2 / 8 / 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
100			dusky red brown (5YR/2/2)				entire core consists of laminated Fe-oxyhydroxides with colors ranging from orange to medium brown to red brown. Overall material is fine-grained silt often forming crusts.	
110			pH=6.10;Eh=89			78		110 ●●
120			9.7YR/2.4/2.65				few cm of olive brown	
130			pH=5.93;Eh=42			79	135cm: thin layer with yellow tinge.	130 ●●
140								
150			pH=6.33;Eh=62 5.5YR/2.35/3.54			80		150 ●●
160			dark reddish brown (10R/3/4)					
170			pH=6.41;Eh=70 3.0YR/3.12/1.69			81	172cm: thin layer with volcanic sand 175cm: fluid in red part	175 ●●
180								
190			moderate brown (5YR/3/4) pH=6.54;Eh=82 5.5YR/3.05/2.14			83	bottom temp. at section B: T=20°C; pH=5.83; Eh=59	195 ●●
200								

Core: POS510 - 20 GC Section: 3 of 3

Lat.: 36°27.21'N Long.: 25°24.15'E Recovery: 300 cm

GEOMAR

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
200			moderate brown (5YR/3/4)				200-210cm: reddish brown mud	
210							210-243cm: reddish brown to moderate brown mud with pronounced Mn-Fe-encrustation (mm-cm), Fe-Mn-oxyhydroxides	
230			2.8YR/2.95/1.47 pH=6.33;Eh=116			84		220 ●●
243							243-268cm: layered Fe-Mn-oxy-hydroxides, minor crust, color ranging from chocolate brown, orange brown, black to medium grey and greenish black layers, layers are between 0.3-1cm in thickness	
260								260 ●●
265			pH=6.32;Eh=86 5.7Y/2.98/1.17			85		
269							@269cm not continous medium grained volcaniclastic layer	
275			7.0YR/1.95/2.22					
280			pH=6.29;Eh=54			86	268-300cm: chocolate brown Fe-Mn-oxyhydroxides with black encrustation, crust often altered and soft	280 ●●
290							Tmax=20°C	
300								

Grainsize scale: 0.06, 2, 8, 32

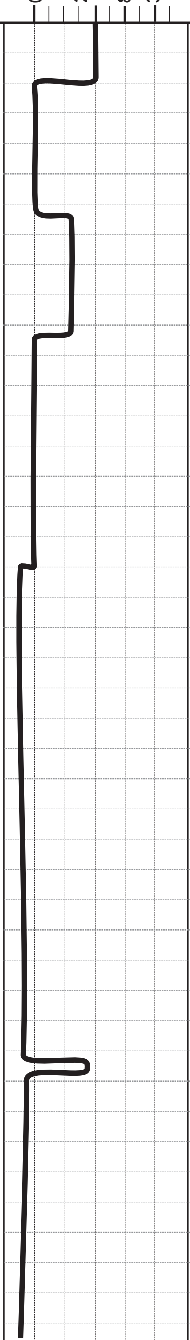
Core: POS510 - 26 GC Section: 1 of 1

Lat.: 36°33.80'N Long.: 25°22.01'E Recovery: 86 cm

GEOMAR

Core Photo (cm, 000–100)

Grainsize (mm): 0.06, 2, 8, 32



Color / pH - Eh

- pH=7.35;Eh=132
- moderate brown (5YR/3/4)
- 6.6YR/2.50/2.98
- pH=6.71;Eh=35
- pH=7.09;Eh=64
- 1.1Y/5.44/3.07
- pH=7.68;Eh=207
- 3.5Y/4.55/1.14
- pH=8.06;Eh=148
- 3.6Y/5.35/1.44
- pH=8.34;Eh=95
- pH=7.93;Eh=105
- pH=7.67;Eh=126

Min

Facies No.

Pore fluids: 89, 90, 91, 92

Comments

000-053cm: reddish brown layered Fe-Mn-oxyhydroxide, with encrustation most probably from previous core!

000-005cm: coarse grained volcaniclatic
005-012cm: silty material without layering

012-023cm: medium to coarse grained volcaniclastic, Fe-oxide clasts, <4mm lithic fragments and crust

023-035cm: layered Fe-Mn-oxyhydroxide

035-053cm: brownish mud with Fe-Mn-encrustation (mm-0.5cm thick crust)

@54cm: Fe-Mn-crust chunks within beige mud (only on one side of the core)

054-086cm: layered mud with color ranging from beige, dark yellowish orange (10YR/6/6) to medium blueish grey (5B/5/1) and light olive grey (5Y/6/1), carboantic matrix?

@69cm: thin, fine- to coarse sandy volcaniclastic layer with few pumice clasts (<2mm) overlying medium blueish grey layer (68-74cm)

000-053cm: wet material in core
053-086cm: dry material from core catcher

Geochem: 25, 45, 60, 70, 77, 83

Core: POS510 - 38 GC Section: 1 of 2

Lat.: 36°36.71'N Long.: 25°33.53'E Recovery: 125 cm

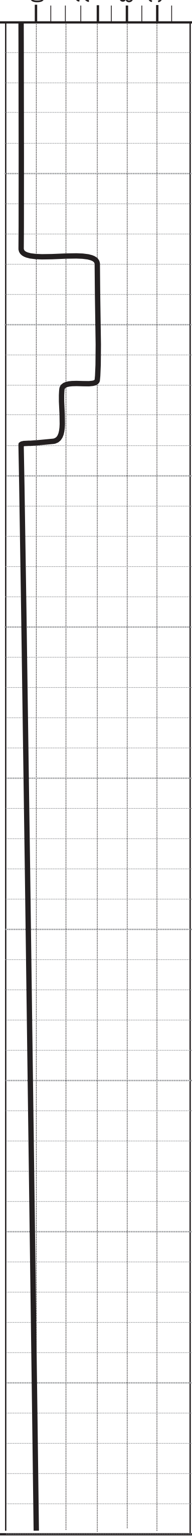
GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-018cm: dry compact beige mud with brownish tinge @5cm: light beige lense 014-017cm: light beige Schlieren	3-5
010								
020							018-025cm: beige mud with pumice clats mostly ~2mm in size, few bigger clasts, sub-rounded	
025								
							core recovery, stored in big plastic bag!	

Core: POS510 - 38 GC Section: 2 of 2

Lat.: 36°36.70'N Long.: 25°33.50'E Recovery: 125 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
025			1.8Y/4.73/2.68 pH=6.91;Eh=240			93	025-030cm: beige clay with few small whitish pumice clasts	28 ●●
035			4.6Y/5.34/1.36 pH=7.6;Eh=206			94	030-041cm: light olive grey mud with few pumice clasts (dark grey ~2mm)	35 ●●
045						95	041-053cm: medium grey layer with medium to coarse grained clast supported mud, pumice clasts <0.5cm, lower 4cm less clasts more silty	45 ●●
			4.2Y/4.13/0.62 pH=7.47;Eh=187					
055								
							@61cm: dark grey silt patch (2cm)	
065								
							053-109cm: pale olive to light olive grey mud with a beige layer from 87-90cm	
075			8.4Y/5.30/1.18					
			pH=7.84;Eh=151					80 ●●
085								
						96	086-110cm: vertical band, grain size ~1mm with volcaniclastic material gas escape pipe, small pumice clasts and dark grey clasts, pipe with finer material towards top	
095								95 ●●
105								
			pH=7.77;Eh=167			97		110
115							110-125cm:dark grey mud (clay) with greenish tinge, very dry, minor silt component	
125								

Core: POS510 - 41 GC Section: 1 of 1

Lat.: 36°36.08'N Long.: 25°33.73'E Recovery: 53 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000			dark yellowish orange (10YR/6/6)				000-003cm: wet beige mud with minor silt to fine sand component	
010			9.9YR/5.34/3.59 pH=7.57;Eh=213			100	003-014cm: beige mud (clay to silt) with olive grey schlieren (from 3-7cm)	10 ●●
							contact with an angle	
020			1.3Y/4.65/2.70 pH=7.56;Eh=226				014-028cm: pale to moderate and dark yellowish brown mud (clay to silt)	
030			1.2Y/5.95/2.59			101	028-046cm: light beige mud with few darker and light schlieren	30 ●●
040			pH=7.63;Eh=205					
050						102	046-053cm: medium to coarse grained, beige, sandy material, with grey tinge, contains fossilized worm and shale fragments, mixed volcaniclastic material? (brown and orange clasts, black small fragments)	50 ●●
053								

Core: POS510 - 42 GC Section: 1 of 1

Lat.: 36°36.71'N Long.: 25°33.37'E Recovery: 51 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-004cm: beige wet clay	
							004-013cm: light beige clay with few light grey schlieren	
010			greyish orange (10YR/7/4) 0.3Y/5.39/3.40 pH=6.97;Eh=240				013-029cm: greyish orange clay	
020						98		20 ●●
030			pH=7.69;Eh=180 1.6Y/5.14/2.55 pale yellowish brown (10YR/6/2)				029-035cm: diffuse layering of beige and light grey clay	
040				Mn?			@40cm: dark brown to black (1cm) spot with Mn-oxide	
			1.0Y/5.89/2.43 pH=7.73;Eh=143			99	035-051cm: pale yellowish brown clay with dark schlieren	45 ●●
051							core catcher (~8cm): brownish sediment with black Mn-chunks	

Core: POS510 - 43 GC Section: 1 of 3

Lat.: 36°33.80'N Long.: 25°22.01'E Recovery: 300 cm

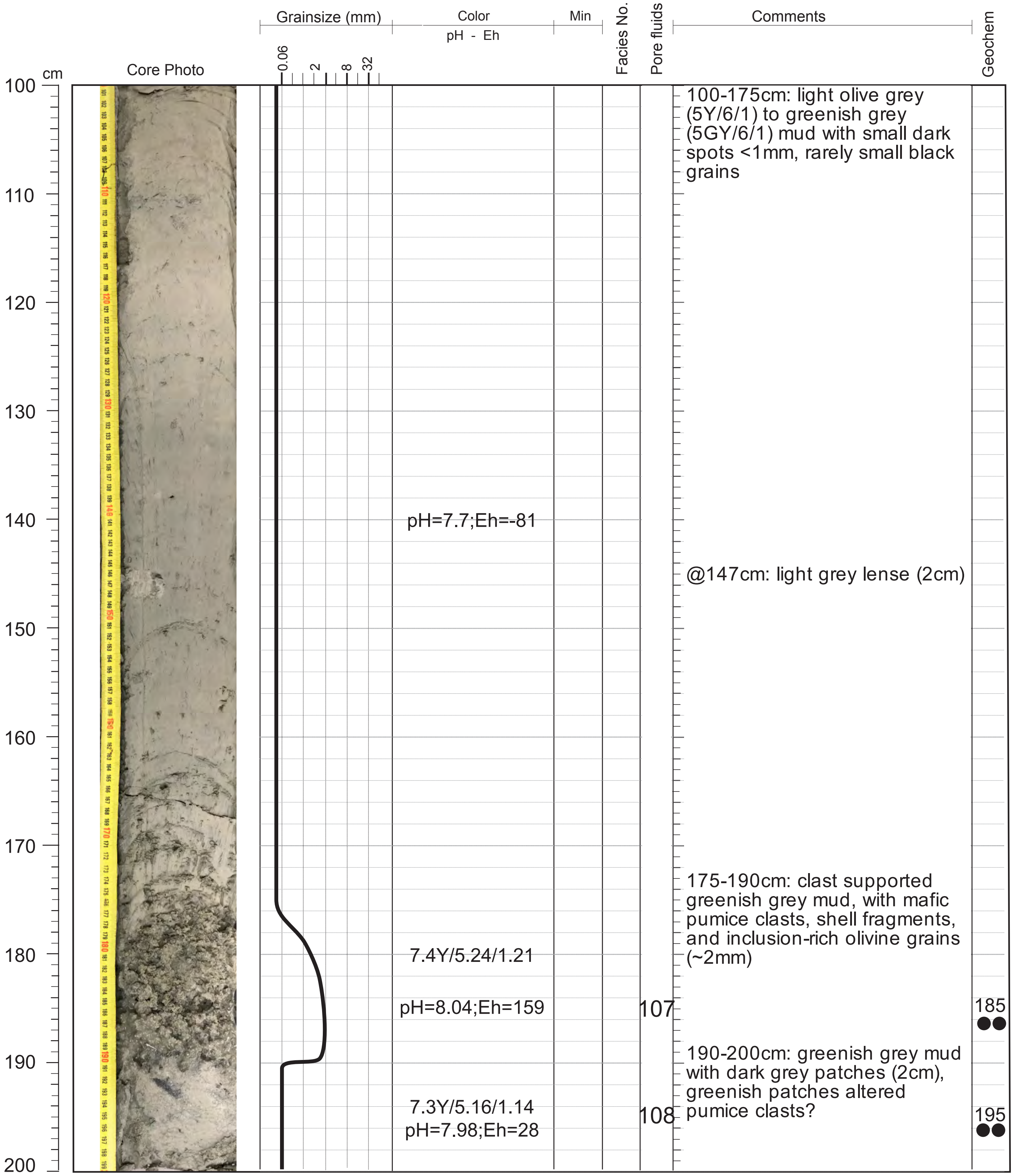
GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-027cm: first 5cm dark beige wet clay, than dark yellowish orange (10YR/6/6) with brownish schlieren	
010			0.1Y/5.32/3.36 pH=7.65;Eh=187			103		10
020							@27cm: sharp boundary	
							027-036cm: pale yellowish brown (10YR/6/2) to grey mud	
030			3.2Y/5.56/1.79 pH=7.79;Eh=36			104	@36cm: light grey wet lense, ca. 1.5cm thick	30
040							037-045cm: light olive (5Y/6/1) clay	
050								
060							045-084cm: olive grey (5Y/4/1) mud with diffuse light grey patches, getting gradual darker towards the bottom	
070			6.4Y/3.84/1.40 pH=7.7;Eh=-16			105		70
080							diffuse boundary	
							084-100cm: light olive grey (5Y/6/1) with dark grey patches	
090						106		90
			5.4Y/5.32/1.33 pH=7.96;Eh=-28					
100								

Core: POS510 - 43 GC Section: 2 of 3

Lat.: 36°36.31'N Long.: 25°33.00'E Recovery: 300 cm

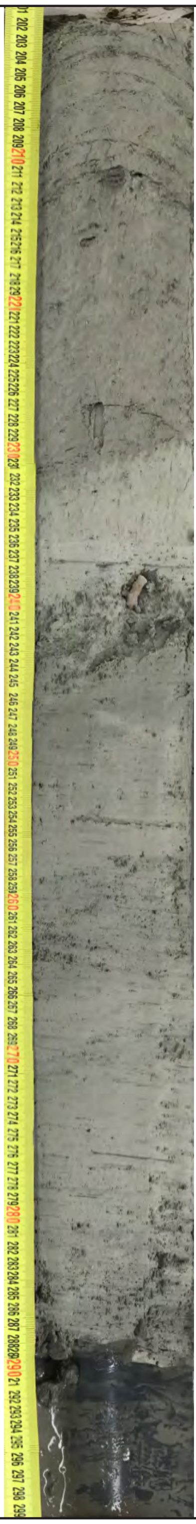
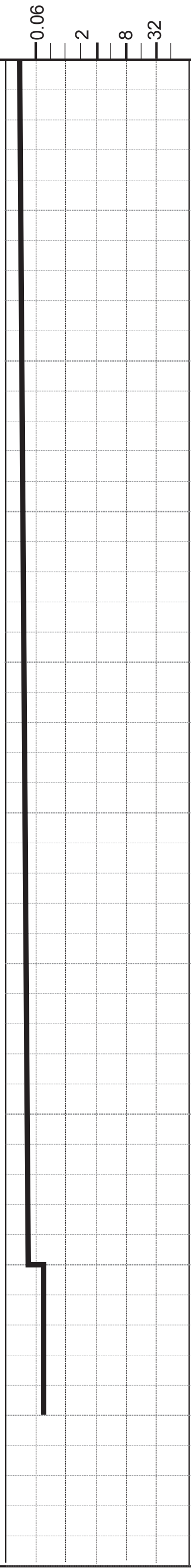
GEOMAR



Core: POS510 - 43 GC Section: 3 of 3

Lat.: 36°36.31'N Long.: 25°33.00'E Recovery: 300 cm

GEOMAR

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
200							200-232cm: light olive grey (5Y/6/1) mud, with few dark spots	
220			8.0Y/4.91/1.23 pH=7.83;Eh=-60			109		220 ●●
							sharp contact with an angle	
230							232-239cm: yellowish grey (5Y/7/2) mud with black spots	
			8.7Y/5.29/1.17					
240							239-244cm: light olive grey (5Y/6/1) mud with black thin stipes from plants? and corals	
260			9.3Y/4.68/0.91 pH=7.63;Eh=180			110	244-288cm: clay to silt with few blackish spots and greenish schlieren, few silt patches towards the bottom small pumice clasts <1mm	260 ●●

Depth scale (cm): 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300

Core: POS510 - 48 GC Section: 1 of 1

Lat.: 36°35.32'N Long.: 25°22.60'E Recovery: 27 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-005cm: moderate brownish clay	
							005-012cm: pale yellowish brown mud	
010							012-021cm: light olive grey mud with darker schlieren	
020							021-027cm: light olive grey mud with black thin stipe from plants? (ca. 2cm long)	
027								
							000-021cm: core recovery 021-027cm: core catcher	
							core 48GC and 49GC are stored in the same core box	

Core: POS510 - 49 GC Section: 1 of 1

Lat.: 36°34.98'N Long.: 25°22.53'E Recovery: 37 cm

GEOMAR

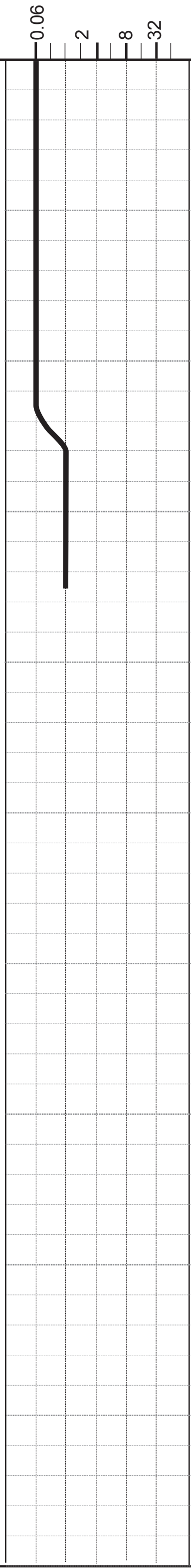
cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-004cm: moderate brown, wet mud with small clasts (fine sand to gravel), lithic fragments, black to brown and red in color	0-1
010							004-015cm: light olive grey mud with greenish tinge and small pumice clasts	
020							015-037cm: light olive grey mud with few darker schlieren	
030							@30cm: 2cm big light grey pumice clasts	
037							core catcher has been stored in an extre bag	

Core: POS510 - 50 GC Section: 1 of 1

GEOMAR

Lat.: 36°33.80'N Long.: 25°21.98'E Recovery: 35 cm

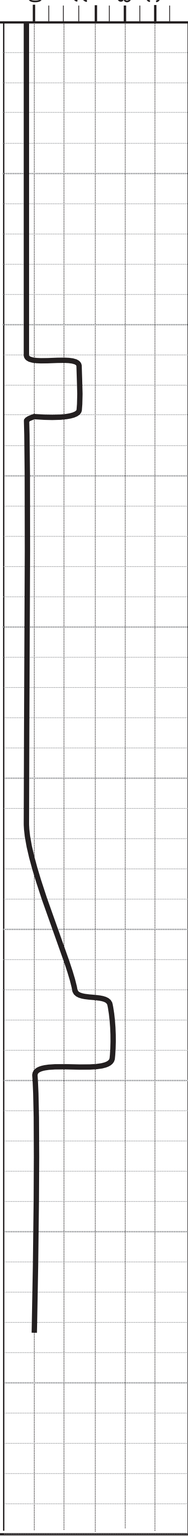
cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-012cm: light to moderate yellowish orange to brown mud	
							@6cm: dark grey spot	
010							012-030cm: light olive grey mud, slightly darker towards bottom increasing silt to fine sand component towards bottom	
020							@21cm: greenish schlieren	
							030-035cm: shell fragments and thin black stipes from plants?, sandy patches with light and darker clasts, medium to dark grey material with pumice clasts up to 1.5cm	
030								
035								
							Repeat of unclear sample 26GC! 000-022cm: core recovery 022-035cm: core catcher	



Core: POS510 - 56 GC Section: 1 of 2

Lat.: 36°42.02'N Long.: 25°47.98'E Recovery: 180 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-010cm: semiliquid sediment with light brown tinge	
			pH=7.66;Eh=168					
010						113	010-020cm: semiliquid but more grey	10
020							020-028cm: orange over grey over coarse dry, light olive grey layer	
			2.9Y/5.21/1.87			114		25
030							028-040cm: yellowish light grey (5Y/7/4) clay	
040						115	040-050cm: clay with faint orange tinge, fluid sample in 'vein'; greyish orange(10YR/7/4)	45
050			2.1Y/6.03/2.17				@50cm: change back to grey clay	
			3.2Y/5.60/2.04				058-066cm: light olive grey (5Y/5/2)	
060						116	066-070cm: medium dark grey (N4), coarse volcaniclastics,start of fluidized channel that reaches	67
070								
080			pH=7.77;Eh=-91			117	070-087cm: light olive grey (5Y/6/1) clay	80
087								

Core: POS510 - 56 GC   Section: 2 of 2

Lat.: 36°42.02'N   Long.: 25°47.98'E   Recovery: 180 cm

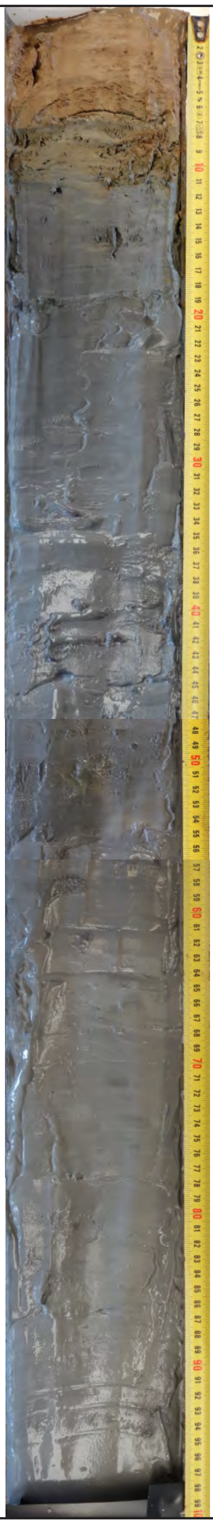
GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
080								
090							086-102cm: light olive grey clay	
100			7.1Y/3.58/1.35 pH=7.9;Eh=-45				102-126cm: dark greenish grey (5GY/4/1); increasingly getting darker, more greenish small white striation	
110								
120						118		125
130							126-178cm: homogenous, light olive grey clay, few shell remnants	
140			7.7Y/5.79/1.23 pH=7.78;Eh=-30				@135cm: single dark patch	
150							@145-150cm: black striations	
160						119		160
170			8.3Y/5.18/1.13					
180								

Core: POS510 - 59 GC Section: 1 of 3

GEOMAR

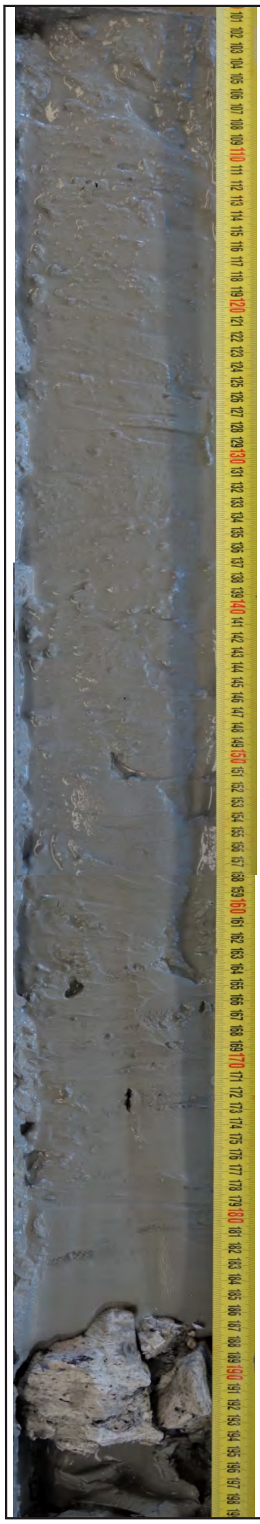
Lat.: 36°30.59'N Long.: 25°26.53'E Recovery: 300 cm

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-008cm: greyish orange to moderate yellowish brown silt with darker brownish schlieren	
			0.6Y/4.31/2.56 pH=7.6;Eh=140			120		05
010			4.7Y/4.31/2.05 pH=7.88;Eh=112				008-012cm: pale olive (10Y/6/2) mud (silt) with brownish schlieren	
020							012-053cm: medium grey mud with light grey schlieren, few small pumice clasts and medium sandgrained patches	
030			medium grey (N5)					
040			6.4GY/4.22/0.24 pH=7.69;Eh=122					
050						121	@51cm: few cm thick sandy layer	50
060								
070							053-100cm: medium light grey clay, semiliquid, few darker and light grey schlieren	
080			medium light grey (N6)					
090			3.6GY/4.85/0.32 pH=7.46;Eh=126			122		90
100								

Core: POS510 - 59 GC Section: 2 of 3

Lat.: 36°30.59'N Long.: 25°26.53'E Recovery: 300 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
100			medium light grey (N6)				100-160cm: homogenous, medium light grey, wet mud (clay) with small, whitish pumice clasts (<2mm)	
110								
120								
130			pH=7.67;Eh=96			123		130 ●●
140								
150								
160								
170							160-200cm: medium light grey clay to silt, less coarser grains than above	
180			pH=7.59;Eh=58 3.9GY/4.85/0.34			124		175 ●●
190							@190cm: huge (10cm) pumice clast devided into WH and AH, few pieces sampled, pumice clast with biotite and amphibol crystals and small mafic enclaves	190
200								

Core: POS510 - 59 GC   Section: 3 of 3

Lat.: 36°30.59'N   Long.: 25°26.53'E   Recovery: 300 cm

GEOMAR

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
200		0.06	medium light grey (N6)				200-300cm: homogenous, medium light grey, wet mud (clay to silt)	
217							@217cm: 5cm big light grey pumice clast	
230			pH=7.55;Eh=-35			125		230 ●●
255							255-274cm:light grey pumice clasts and few fine-medium grained sandy patches with dark and light grey grains in mdeium light grey wet mud	
288							288cm: 2cm pumice clast	
290			pH=7.54;EH=-29 3.9GY/4.85/0.34			126		290 ●●
300								

Grainsize scale: 0.06, 2, 8, 32

Depth scale (cm): 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300

Core: POS510 - 63 GC Section: 1 of 1

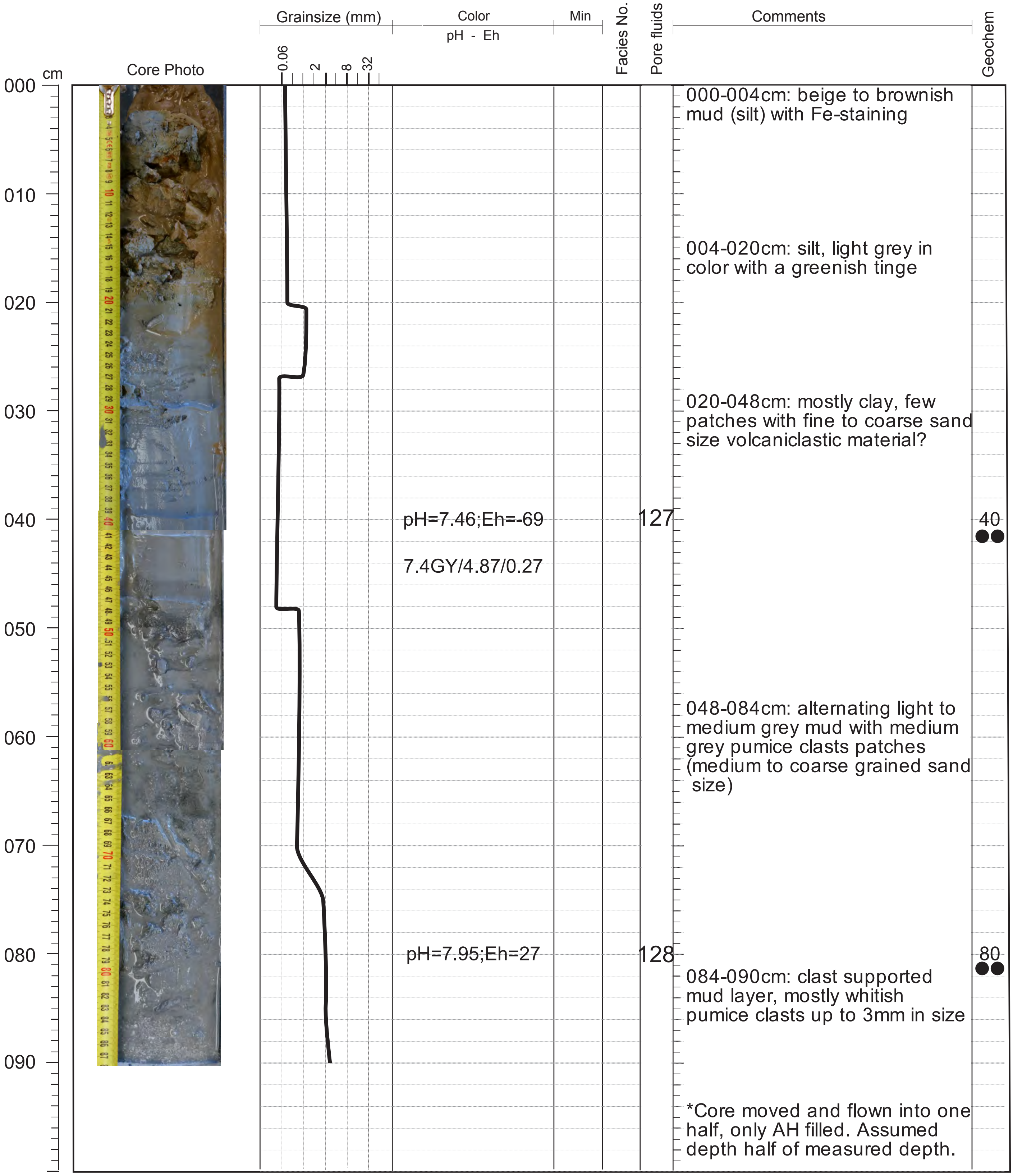
Lat.: 36°29.85'N Long.: 25°27.33'E Recovery: 100 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000			0.9Y/4.51/2.82 pH=7.57;Eh=61			129	000-007cm: light yellowish brown silt	05
010			0.1GY/4.44/0.38				007-024cm: medium light grey fine sand, few small pumice clasts	
020			pH=7.68;Eh=32			130 131	024-033cm: clast supported mud, @024-028cm coarse to very coarse grained than medium to coarse grained volcaniclastic material	20 25
030							033-050cm: towards the bottom the clast component is getting smaller	
040								
050								
060			pH=7.51;Eh=-75			132	050-100cm: medium to light grey clay with minor silt component	60
070			4.2GY/4.38/0.27					
080								
090								
100								

Core: POS510 - 67 GC Section: 1 of 1

Lat.: 36°29.06'N Long.: 25°26.86'E Recovery: 090 cm

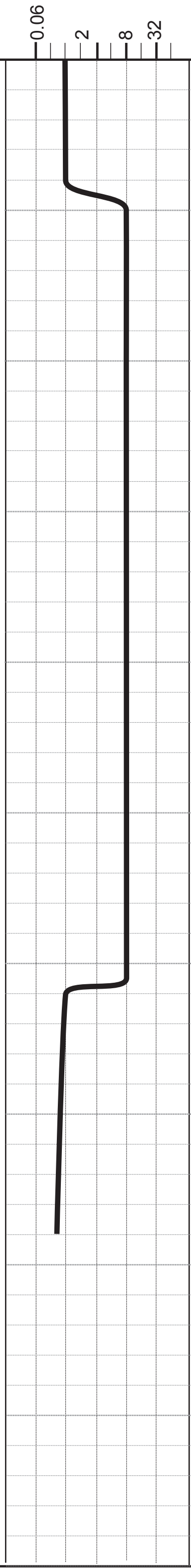


Core: POS510 - 69 GC   Section: 1 of 1

Lat.: 36°31.64'N   Long.: 25°29.18'E   Recovery: 078 cm

GEOMAR

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-008cm: Fe-oxide rich mixed layer, with pumice clasts light to dark grey in color and lithic fragments	
			pH=7.54;Eh=134 7.8YR/3.98/2.58					08
010								
020						134	008-061cm: coarse grained heterogeneous pumice layer, mostly whitish pumice clasts 1mm to 4cm in size, few dark clasts, rarely clasts with a greenish tinge, subangular to angular clasts	25
030								
040								
050								
060						135	061-063cm: 2cm thick medium grey layer with brownish tinge, fine sand material	62
070			5.4Y/3.29/0.13 pH=6.52;Eh=138			136	063-078cm: dark grey fine sand material, sulphide-rich	70
078								



Core: POS510 - 70 GC Section: 1 of 1

Lat.: 36°31.58'N Long.: 25°29.20'E Recovery: 100 cm

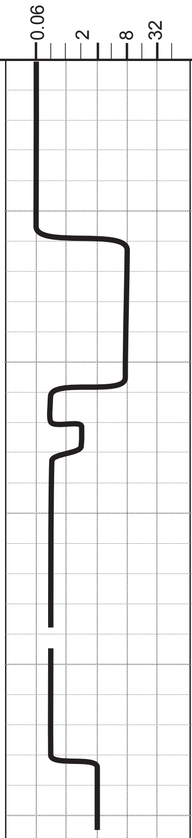
GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 / 2 / 8 / 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000			pH=6;Eh=-37				000-084cm: clast supported homogeneous mud (silt), clasts are very heterogeneous in size ranging from mm-5cm, mostly pumice clasts, few layered ignimbrite clasts (sampled @30)	
010						137		10
020								
030			6.3GY/3.18/0.19				few clasts with brownish and yellowish coating	30
040								
050			pH=5.97;Eh=-14					
060								
070						138		70
080							084-100cm: clast supported silt, mm-5cm big clasts, angular to subangular, pumice and light grey volcanic clasts, material less wet than above, pyrite crystallisation on surface of volcaniclasts (@93cm, sampled)	
090								93
						140	Tmax= 54°C	95
100			pH=6.7;Eh=-29					

Core: POS510 - 73/2 GC   Section: 1 of 1

Lat.: 36°25.02'N   Long.: 25°41.69'E   Recovery: 051 cm

GEOMAR

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000			0.9Y/4.60/2.98 pH=7.51;Eh=170			141	000-010cm: beige to light brown mud with clasts and lithic fragments	05
010							010-024cm: coarse grained material with big clasts up to 3cm in size	
020			pH=7.85;Eh=180				015-024cm: light grey mud, low angle contact with dark grey to black grains	20
030			1.6Y/5.62/2.53 pH=7.63;Eh=173			142	024-043cm: beige dry silty material with greenish tinge gradual getting darker towards the bottom @31cm: 1cm thick olive grey band	30
040			2.0Y/5.26/2.07 pH=7.31;Eh=158			143	043-051cm: sandry dry material with light and grey and black grains, overall material light olive grey with brownish tinge	40
050							*last 10cm of core recovered from core catcher	

Core: POS510 - 78 GC Section: 1 of 2

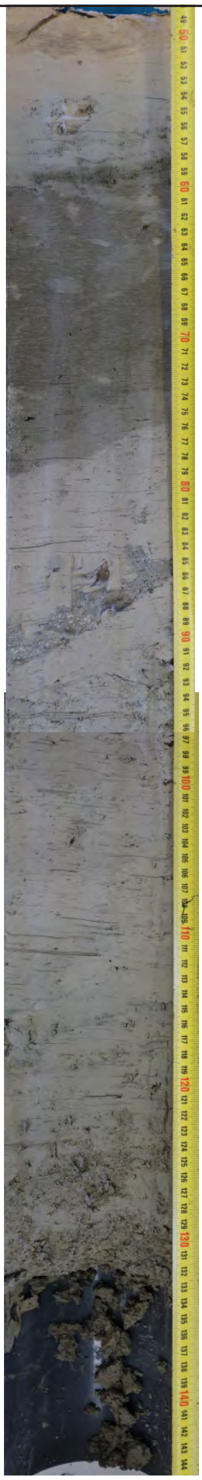
Lat.: 36°37.40'N Long.: 25°34.70'E Recovery: 133 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 / 2 / 8 / 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000			0.8Y/4.78/2.74 pH=7.82;Eh=141				000-006cm: semiliquid, moderate yellowish brown (10YR/5/4) mud; mostly clay with small clasts	04
							006-010cm: brownish mud (clay) with greyish tinge	
010			4.7Y/4.68/1.35 pH=7.81;Eh=142			144	010-014cm: medium light grey clay, dry	13
020			1.3Y/5.96/2.26				014-040cm: light beige to yellow brownish mud, slightly getting darker towards the bottom	
030							040-048cm: light beige clay, grey orange (10YR/7/4)	
040			pH=7.54;Eh=147			145		40
048								

Core: POS510 - 78 GC Section: 2 of 2

Lat.: 36°37.40'N Long.: 25°34.70'E Recovery: 133 cm

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
048		0.06 2 8 32					048-051cm: beige mud with brownish schlieren	
							051-058cm: grey clay with greenish tinge @55cm: wet grey patch	
058								
			light olive grey (5Y/5/2)				058-076cm: light olive grey clay with light grey patches and striation	
068			7.0Y/4.04/1.09 pH=7.73;Eh=14			146		70 ●●
							076-115cm: yellow grey with greenish tinge more pronounced towards the bottom, few black schlieren	
078			yellow grey (5Y/7/2)					
088			pH=7.82;Eh=-61 (within grey band)			147	085-090cm: light olive grey silt band with an angle, ca. 2cm thick and only few cm deep; has been sampled	86-90
098			4.7Y/5.36/1.21					
108			pH=7.45;Eh=100			148		110 ●●
							115-133cm: olive grey silt with greenish tinge and small grains, black thin stipes of plants?; fine sandy material towards the bottom	
118			7.5Y/4.97/1.22 light olive grey (5Y/6/1)					
128								130
138								
148								

GEOMAR

Core: POS510 - 79/2 GC Section: 1 of 1

Lat.: 36°36.65'N Long.: 25°33.42'E Recovery: 075 cm

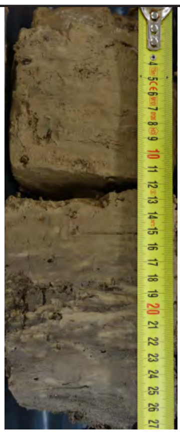
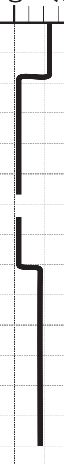
GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-007cm: semiliquid moderate yellowish brown clay	
			0.4Y/4.73/2.39 pH=7.67;Eh=155			149	007-008cm: thin dry moderate yellow brown clay layer	05
010			pH=7.54;Eh=123				008-014cm: medium grey clay layer	
020								
						151	014-075cm: homogeneous medium light grey clay, semi-liquid, few darker spots and layers, light sulphur smell	25
030								
040								
050								
060			1.2G/4.62/0.22 pH=6.37;Eh=189			150		60
070								
075								

Core: POS510 - 80 GC Section: 1 of 1

Lat.: 36°36.04'N Long.: 25°33.81'E Recovery: 027 cm

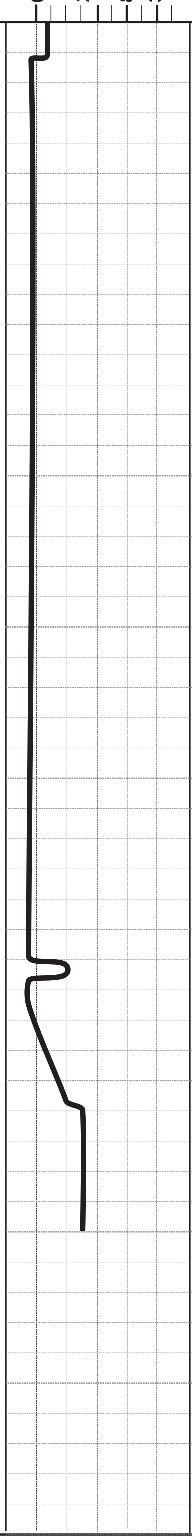
GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-004cm: semiliquid yellowish brown mud, clay to medium sand with small clasts	
010							004-016cm: dry yellowish brown mud with small clasts and dark patches	
020							016-027cm: diffuse layering of yellowish-brown to dark grey-brown layers/bands, fine to medium sand size	
027								
							*first 12cm from core recovery than 15cm recovered from core catcher	

Core: POS510 - 87 GC Section: 1 of 2

Lat.: 36°31.48'N Long.: 25°29.35'E Recovery: 180 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 / 2 / 8 / 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000			moderate reddish brown (10R/4/6)			152	000-004cm: semiliquid Fe-oxide rich mud, mostly silty material	01
010							004-055cm: reduced Fe-oxide rich mud olive-brown to grey with gradual changing color material consists of homogeneous clay	
020			dark yellowish brown (10YR/4/2) to olive grey (5Y/4/1)					
030								
040			pH=6.95;Eh=-148			153		45 ●●
050			1.4Y/2.93/3.24				055-070cm: slightly darker	
060			3.9Y/2.57/2.08				@64cm: distinct 1cm thick sulphide rich layer (sampled)	
			pH=7.08;Eh=-131			154	064-071cm: few small pumice clasts ~2mm	64 ●●
070			olive grey (5Y/3/2)					
			pH=7.11;Eh=-62			155	071-080cm: coarse grained sandy volcaniclastic material	75
080								

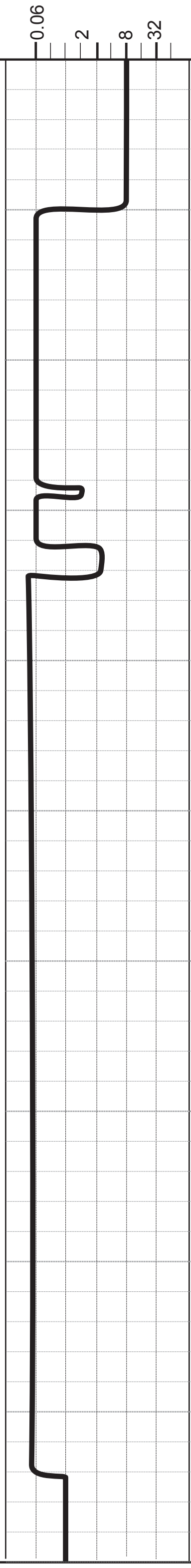
Core: POS510 - 87 GC Section: 2 of 2

Lat.: 36°31.48'N Long.: 25°29.35'E Recovery: 180 cm

GEOMAR

Core Photo

Grainsize (mm)



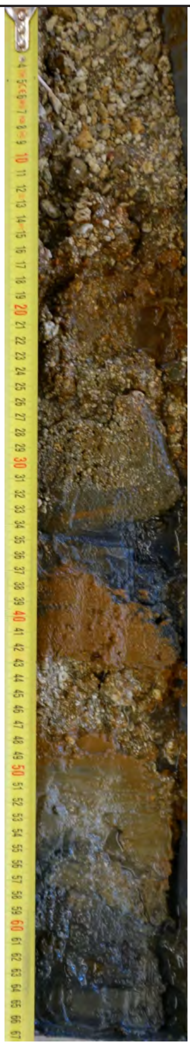
cm	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
080					080-090cm: coarse grained volcaniclastic material with pumice clasts up to 2cm	
090	8.0YR/3.11/4.22 pH=6.93;Eh=-12				090-110cm: thin layered Fe-oxide rich, orange-brown clay to silt	
100	moderate brown (5YR/3/4)			156	@108cm: distinct thin volcanic clastic layer (<2 mm) greyish	100 ●●
110	6.1Y/2.84/1.69				@113cm: ca 2cm thick medium grained volcaniclastic layer, light olive grey	
120					114-175cm: homogenous olive grey clay	
130	olive grey (5Y/3/2)					
140						
150	pH=7.16;Eh=-98			157		150 ●●
160	6.1Y/2.70/1.74					
170					few dark schlieren from @170-175cm	
180	pH=7.50;Eh=-144 7.3GY/2.48/0.22			158	175-180cm: dark olive grey to black, dry, fine sandy, sulphide-rich layer	●● 179

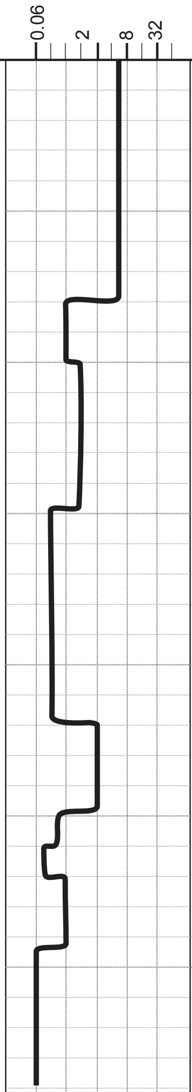
Core: POS510 - 89/2 GC Section: 1 of 1

Lat.: 36°31.30'N Long.: 25°29.21'E Recovery: 068 cm

GEOMAR

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-031cm: coarse grained pumice layer, mostly light grey clasts (mm-cm), subrounded	
010							014-023cm: yellowish brown silt	
020								
030							028-034cm: dark olive grey fine sand	
							034-037cm: dark grey mud, light sulphur smell	
040							037-043cm: reddish brown mud	42
							043-048cm: coarse grained pumice layer	
050							048-058cm: 2cm thick brownish mud layer followed by olive grey silt with few pumice clasts	
060							058-068cm: dark grey silt with slight olive tinge	
						160		65
068								



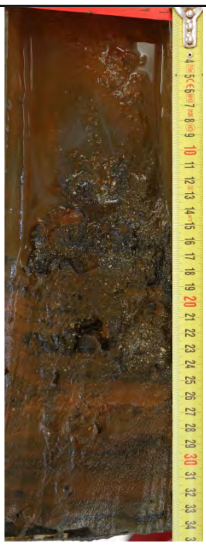


*Only one core half filled, bit material in the second half which has been sampled. Measured depth is not reprsenting the true depth. Only one half (AH) has been stored.

Core: POS510 - 90/3 GC   Section: 1 of 1

Lat.: 36°31.32'N   Long.: 25°29.09'E   Recovery: 035 cm

GEOMAR

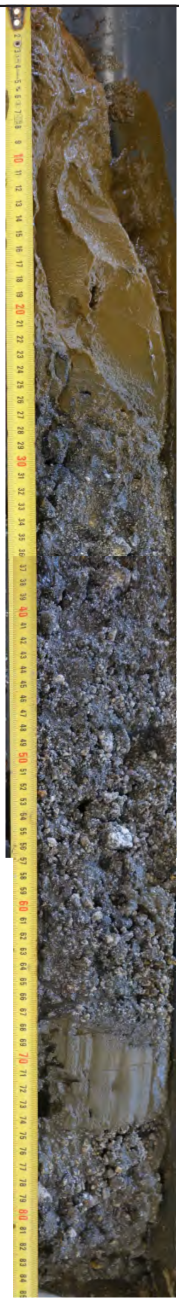
cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-007cm: liquid Fe-oxide rich mud, reddish-brown in color	
010							007-014cm: semiliquid olive-brown mud with greyish tinge	08
020							014-023cm: black to olive grey mud with whitish pumice clasts	
030							023-035cm: layered Fe-oxy-hydroxide, color ranging from dark grey to orange brown and olive grey (cm-layers)	30
035							overall material wet silt	
							*Material of top layers flowed out.	

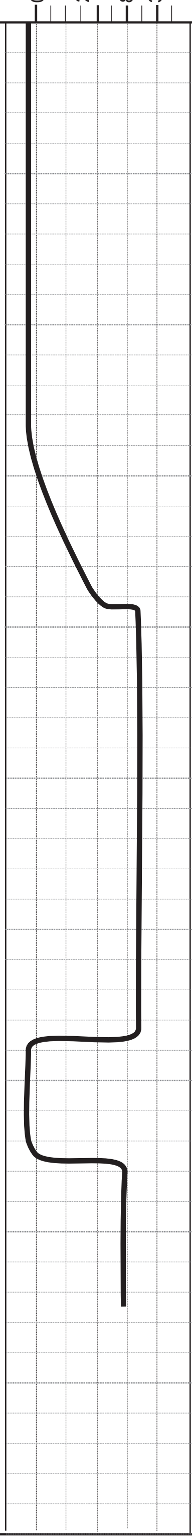
Core: POS510 - 91 GC Section: 1 of 2

GEOMAR

Lat.: 36°31.51'N Long.: 25°29.08'E Recovery: 185 cm

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000		0.06 2 8 32					thin reddish-orange Fe-oxide rich layer on top	
							000-027cm: semiliquid moderate olive brown clay layer	
010								
			3.0Y/2.82/2.51					
020			pH=6.86;Eh=-74			162		20 ●●
030			pH=7.07;Eh=-73	S^0				
040								
							027-067cm: pumice layer, few pumice clay with sulphur coating, first 10cm mostly clast (<2mm) than between mm-3cm big clasts, whitish, mostly subangular, greyish silty mud as matrix	
050								
060						163		60
070			6.3Y/3.47/0.95 pH=6.82;Eh=-48			164	067-075cm: olive grey clay-rich mud layer	70 ●●
							075-085cm: pumice clasts with muddy grey matrix	
080				S^0				
085								





Core: POS510 - 91 GC Section: 2 of 2

Lat.: 36°31.51'N Long.: 25°29.08'E Recovery: 185 cm

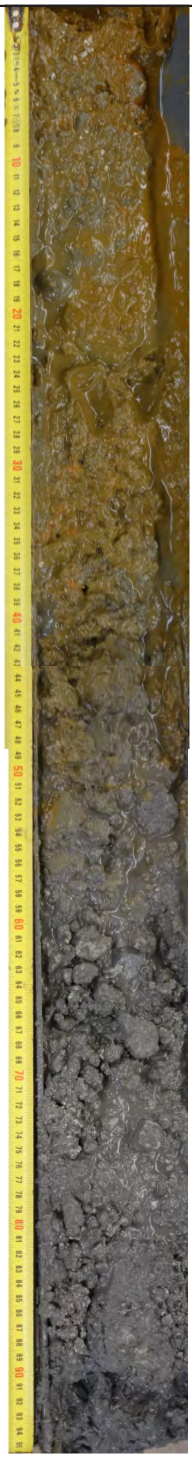
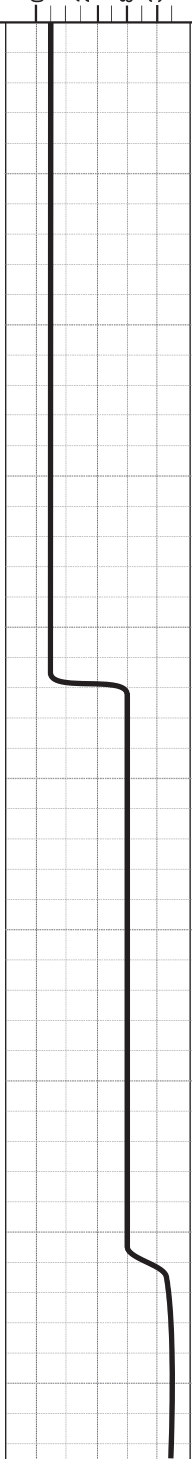
GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
085							085-101cm: clast rich olive grey mud	
095								
105			8.0Y/3.04/1.30 pH=6.76;Eh=78			165	101-109cm: olive grey mud with silt to fine sand	105 ●●
115			pH=7.34;Eh=-75				109-120cm: dark grey clast supported mud layer, sulphur smell from 112-115cm: orange tinge	
						166		120
125			6.0Y/3.08/1.30				120-160cm: homogeneous mud (clay) layer, moderate olive brown with greenish tinge, gradual getting darker towards the bottom	
135								
145			pH=6.75;Eh=-83			167	@140cm: clast rich dark grey reaching	150 ●●
155								
165			9.9Y/3.29/0.50				160-171cm: dark greenish grey silt	
175			3.2GY/2.46/0.34 pH=6.21;Eh=-7			168	171-180cm: fine to medium grained sandy material, dry, dark grey	175 ●●
185				S^0			180-185cm: very coarse grained pumice layer, string sulphur smell	

Core: POS510 - 92 GC Section: 1 of 2

Lat.: 36°31.58'N Long.: 25°29.20'E Recovery: 190 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							Only one core half filled with material, measured depth assumed to be twice of true depth! Upper part moved.	
010							000-007cm: strong orange brown Fe-Oxide rich layer	
020			moderate olive brown (5Y/4/4)				007-043cm: moderate olive brown mud with brownish and greyish schlieren; clay with small clasts	
030			pH=5.93;Eh=22			169		30
			pH=5.93;Eh=-5					
040								
050							043-054cm: coarse to medium grained mixed volcanic layer	
060							054-095: very coarse grained pumice layer with medium dark grey mud; subrounded to angular light greyish clasts (mm-10cm)	
			pH=6.05;Eh=20					
070								
			medium dark grey (N4)			170		75
080							@85cm: 10cm long light greyish pumice clast (sampled)	
090								90
095								

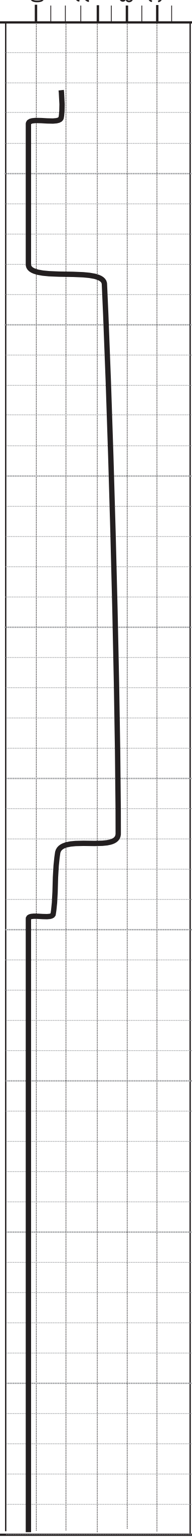
Core: POS510 - 92 GC   Section: 2 of 2

Lat.: 36°31.60'N   Long.: 25°29.20'E   Recovery: 190 cm

GEOMAR

Core Photo

Grainsize (mm)

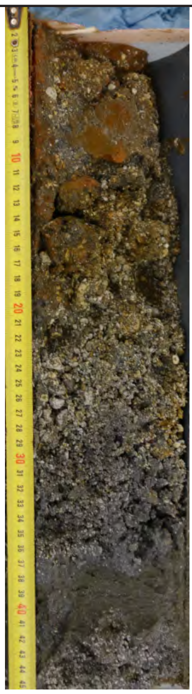
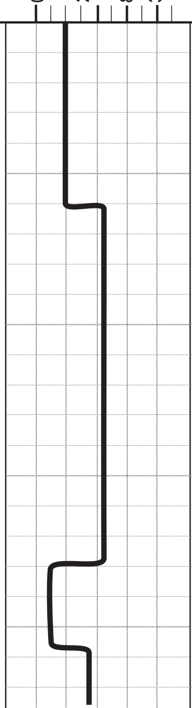


cm	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
090					first 5cm empty than 1cm with pumice clasts	
100	2.4G/3.13/0.17 pH=6.42;Eh=12			171	096-106cm: dry compact clay layer, medium dark grey	100 ●●
110						
120					106-144cm: coarse grained pumice layer (mm-cm in size) with medium dark grey clay matrix	
130						130
140						
150	4.0Y/3.66/1.09 pH=6.73;Eh=32			172	144-148cm: light olive grey mud with faint brownish tinge, top with sandy light grey 2mm thick rim, bottom with thin silt rim, dry material	147 ●●
160	2.6GY/4.14/0.16				148-190cm: dry medium grey clay, baked, homogeneous	
170	pH=6.86;Eh=64			173		170 ●●
180					Tmax= 99°C (during pH and Eh measurements still 28°C warm)	
190						

Core: POS510 - 93/2 GC   Section: 1 of 1

GEOMAR

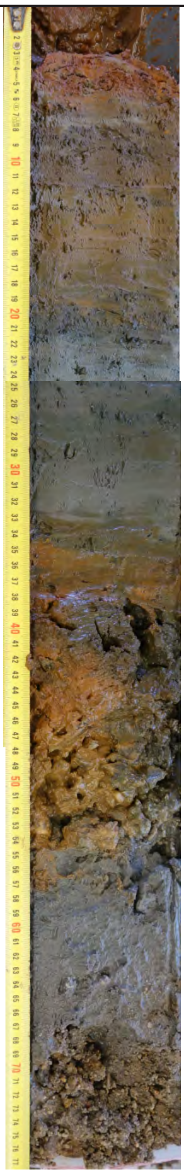
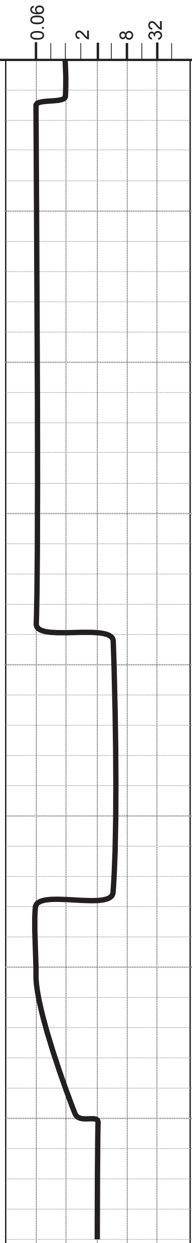
Lat.: 36°31.64'N   Long.: 25°29.21'E   Recovery: 45 cm

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-022cm: reddish-brown to yellow-brown mud with pumice clasts (<2mm), volcaniclastic material	
			pH=7.07;Eh=-126				@8cm: dark grey sample with orange-brown to olive tinge	08
010								
020							022-036cm: coarse grained pumice layer with mud matrix, mud with olive tinge slightly grey towards the bottom, clasts with light yellow tinge (sulphur coating?), mud percentage more pronounced in the last 5cm, light sulphur smell	
030								
			7.7Y/3.40/0.72				036-042cm: medium grey mud layer (clay-fine sand) with olive tinge	40
040			pH=7.22;Eh=-19			174		
045							042-045cm: whitish pumice clasts	
							Tmax=19°C	

Core: POS510 - 96/1 GC Section: 1 of 1

GEOMAR

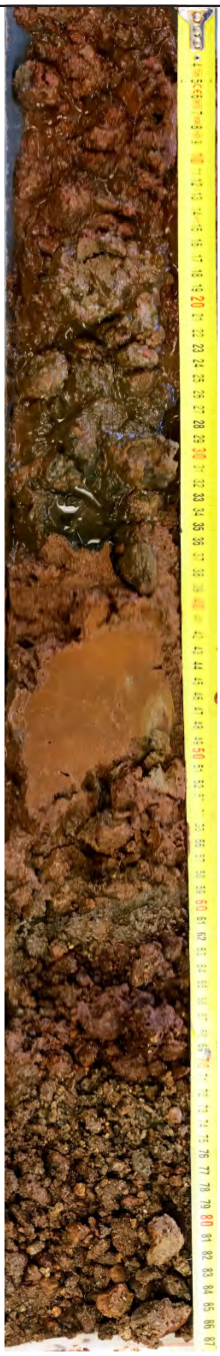
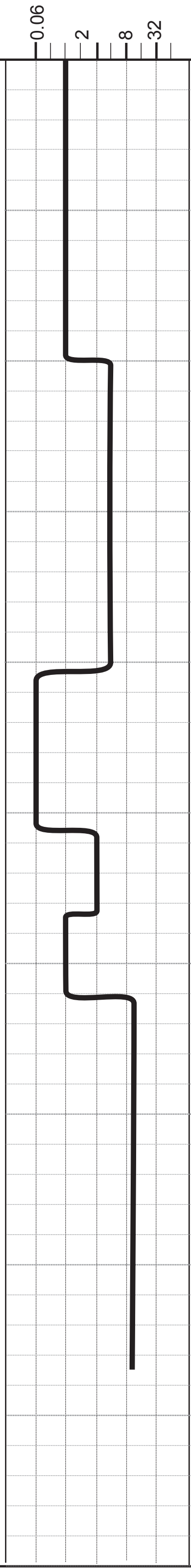
Lat.: 36°24.42'N Long.: 25°21.65'E Recovery: 78 cm

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000			pH=7.38;Eh=119			176	000-003cm: semiliquid Fe-oxy-hydroxide rich mud, mostly sandy material	04
010			1.0Y/2.84/2.43				003-038cm: layered Fe-oxy-hydroxide, reddish-brown to yellowish-brown, brown and grey layers with greenish tinge, mm-cm thick layers, overall material silty with few small clasts	
020								
030			pH=7.14;Eh=130 8.1Y/3.17/1.09			177		28 ●●
040							038-055cm: coarse grained pumice layer with clay matrix, one half of core dark brown other half yellowish-reddish brown	
050			pH=7.35;Eh=142			178		49
060			5.1Y/3.16/0.77 pH=7.04;Eh=127			179	055-068cm: medium grey silty material which is coarsening downward	64 ●●
070							068-078cm: medium grained sand with coarser clasts, volcaniclastic layer	
078								

Core: POS510 - 96/2 GC Section: 1 of 1

Lat.: 36°24.43'N Long.: 25°21.65'E Recovery: 87 cm

GEOMAR

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-020cm: reddish-brown mud with few small clasts, soft pieces of crust, color changes to olive brown towards the bottom	
010			pH=6.68;Eh=164					09
			7.9YR/3.00/2.17				@19cm: big 5cm pumice clast	
020			pH=6.93;Eh=162			180	020-036cm: very coarse grained pumice layer with mud matrix, mud olive-brown to grey in color	25
030							036-051cm: reddish-brown to orange clay-silt, top with thin 2mm thick black layer	
040			pH=6.83;Eh=169 6.73YR/3.06/4.28			181	@48cm: greyish lense with reddish-brown core	45
050							contact with an angle from 51-58cm, reddish brown material clast-rich	
060							058-062cm: mixed volcaniclastic layer, medium grained (<2mm), greyish layer, with white, reddish and dark grey clasts	
070							062-087cm: pumice layer, until 70cm strong reddish-brown coating than greyish clasts, clasts are mm-cm in size	75
080							Tmax=20°C	
087								

Core: POS510 - 97 GC   Section: 1 of 1

Lat.: 36°24.58'N   Long.: 25°21.66'E   Recovery: 030 cm

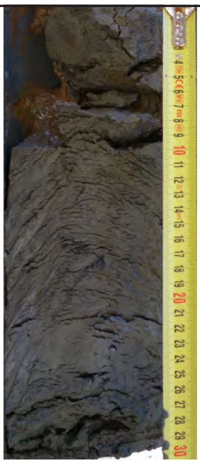
GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-012cm: dark yellowish brown sandy material with olive tinge, black crust-fragments on top, shell remnants	06
010			1.4Y/3.71/2.27				012-030cm: olive grey silt	
020			pH=7.55;Eh=-76			182	@20cm: dark grey sand patch	20
			6.6Y/3.25/1.25				025-030cm: black stripes, up to 0.5cm thick, coarser material in black patches	
030								

Core: POS510 - 98 GC Section: 1 of 1

Lat.: 36°24.27'N Long.: 25°21.61'E Recovery: 030 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-002cm: yellowish-brown mud with silt-sand material	
010			olive grey (5Y/4/1)				002-030cm: olive grey clay to silt with small clasts, dry material few dark patches and striation	
020			pH=7.75;Eh=-64 8.0YR/3.11/4.22			183	@23cm: light grey patch slightly wet	20
030								

*WH and AH are stored together in one tube.

Core: POS510 - 99 GC Section: 1 of 1

Lat.: 36°23.24'N Long.: 25°22.13'E Recovery: 027 cm

GEOMAR

Grainsize (mm) | Color pH - Eh | Min | Facies No. | Pore fluids | Comments | Geochem

cm | Core Photo | 0.06 2 8 32

000

010

020

027

5.5Y/3.80/0.77

olive grey
(5Y/4/1)

pH=7.82;Eh=-66

184

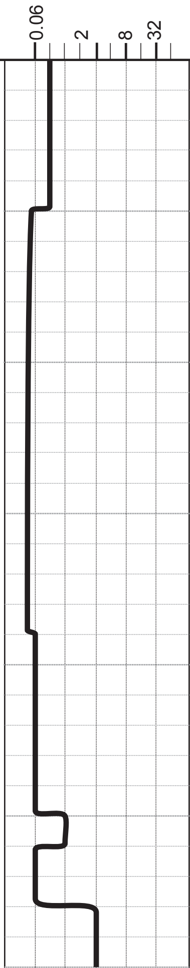
000-027cm: olive grey mud with orange-brown and black striation top with thin yellowish brown mud layer, shell remnants and few small clasts <5mm, overall material silt

20

Core: POS510 - 100 GC Section: 1 of 1

Lat.: 36°23.10'N Long.: 25°22.08'E Recovery: 060 cm

GEOMAR

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000			pH=6.88;Eh=-61				000-004cm: semiliquid layered Fe-(Mn)-oxyhydroxide, silt to fine sand material	06
010						185	004-010cm: olive grey silt to fine sand @11cm: 5mm thick black Fe-crust?	13
020							011-038cm: layered Fe-oxy-hydroxide, mm-cm thick layers, containing clay to silt	
030			moderate brown (5YR/4/4) measured: pH=6.18;Eh=-5 7.3YR/2.52/2.08				@35cm: thin sandy layer @36cm: black crust overlayering strong orange crust	
040			pH=6.20;Eh=-32 2.2Y/3.52/1.51			186	038-060cm: light olive grey silt with orange schlieren	45
050			light olive grey (5Y/5/2)				@50-52cm: wet volcaniclastic layer, medium sand size grains, orange schlieren 056-060cm: one core half with coarse grained volcaniclastic material (mm-0.8cm)	
060							Tmax=25°C	

Core: POS510 - 106 GC   Section: 1 of 1

Lat.: 36°27.00'N   Long.: 25°24.76'E   Recovery: 100 cm

GEOMAR

Core Photo

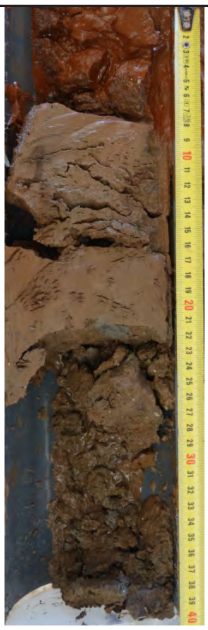
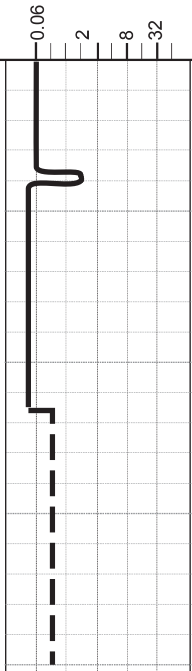
Grainsize (mm): 0.06, 2, 8, 32

cm	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000					overall material silt to fine sand getting finer towards the bottom mostly clay to silt	
					000-009cm: muddy material with clasts and pieces of crust, yellowish brown	
010	pH=6.73;Eh=-20 0.7Y/3.28/2.09			187		10
020					009-042cm: layered Fe-oxy-hydroxide dark yellowish brown to greyish layers alternating with reddish brown layers	
030					@34cm: sampled 0.5cm thick Fe-crust, with greenish grey clay rim	34
040	pH=6.73;Eh=-3			188		40
					042-100cm: layered Fe-oxy-hydroxide cm in size, reddish-brown to black and yellowish brown, with encrustation up to 0.5cm thick, few clasts (beige, light grey, ≤0.5cm), reddish spots	
050	7.4YR/2.80/1.61					
060						
070	pH=6.49;Eh=42			189		70
					075-081cm: few thin grey-green layers, celadonite?	
080	8.2YR/3.32/1.71					
	pH=6.27;Eh=8					
090					@93cm: 5cm big round dacite clast	
100						

Core: POS510 - 110 GC Section: 1 of 1

Lat.: 36°26.70'N Long.: 25°23.21'E Recovery: 040 cm

GEOMAR

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000			pH=7.60;Eh=209 6.4YR/3.20/3.46			190	000-007cm: Fe-oxide rich mud, semiliquid, clay to silt, strong reddish-brown	01
010							@8cm: medium to coarse grained thin layer, moderate brown 008-023cm: yellowish brown clay with few clasts up to 4mm in size, few moderate brown and grey patches	
020			0.7Y/3.72/2.60			191		20
			pH=7.74;Eh=48					
030							023-040cm: yellowish brown clay with greenish tinge and small angular clasts <2mm	
040								
							* Core catcher with ca 3cm of sample. WH and AH are stored together in one core.	

Core: POS510 - 111 GC Section: 1 of 1

Lat.: 36°15.59'N Long.: 25°18.69'E Recovery: 060 cm

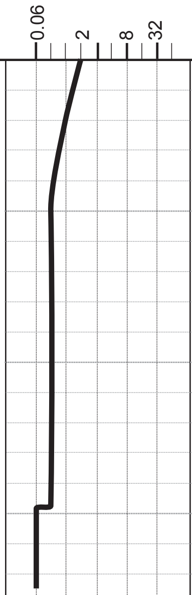
GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000			pH=7.59;Eh=248				000-006cm: wet beige mud with medium to coarse grained sand	04-06
010								
020			9.6YR/5.25/3.11 pH=7.74;Eh=216			192	006-039cm: yellowish brown mud (clay with sandy grains) gradual getting darker towards the bottom	20
030								
040			1.0Y/5.31/2.52			193	039-050cm: beige silt with brownish and greyish striation	45
050							050-056cm: greyish mud (clay to silt) with few beige schlieren	
060			4.8Y/4.32/0.68 pH=8.03;Eh=166			194	056-060cm: olive grey clay with few shell remnants	56

Core: POS510 - 112 GC Section: 1 of 1

Lat.: 36°15.31'N Long.: 25°18.98'E Recovery: 035 cm

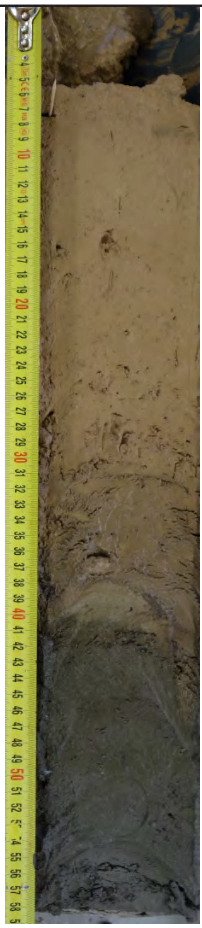
GEOMAR

cm	Core Photo	Grainsize (mm)	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-005cm: coarse grained sand, wet, beige in color	
010			pH=7.66;Eh=168			195	005-025cm: light beige mud (clay to sand) with few small clasts, increasing clast content towards the bottom	10
020			9.4YR/5.35/2.73					
030								
035			pH=7.75;Eh=204			196	025-035cm: beige schlieren in brownish silt, clasts and few small sandy patches interlayered	33

Core: POS510 - 113 GC   Section: 1 of 2

Lat.: 36°14.43'N   Long.: 25°17.19'E   Recovery: 150 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
000							000-006cm: medium to coarse grained sandy material, wet, beige in color	
010						197	006-032cm: clay to fine sand, beige in color	15
			8.0YR/3.11/4.22 pH=7.71;Eh=167					
020							from 025-040cm: few grains smaller than 2mm	
030							032-040cm: moderate yellowish brown mud	
			pH=7.72;Eh=204			198	@39cm: coarser grained (≤1mm), moderate brown 1cm thick layer (sampled)	
040			moderate yellowish brown (10YR/5/4)					40
							040-060cm: olive grey clay to fine sand with light grey spots	
050			5.6Y/3.73/1.28 pH=7.94;Eh=167			199		
			olive grey (5Y/4/1)					55
060								

Core: POS510 - 113 GC Section: 2 of 2

Lat.: 36°14.43'N Long.: 25°17.19'E Recovery: 150 cm

GEOMAR

cm	Core Photo	Grainsize (mm) 0.06 2 8 32	Color / pH - Eh	Min	Facies No.	Pore fluids	Comments	Geochem
050								
060								
070							060-095cm: light olive grey silt to medium sand with a few light fine dark patches	
080			pH=8.19;Eh=185 6.6Y/4.62/0.91			200		80
090								
100			pH=8.00;Eh=104 5.9Y/4.74/0.65			201	095-106cm: olive grey sandy material	100
110								
			5.4Y/5.22/1.13					
120							106-134cm: yellowish grey silt to medium sand, slightly getting darker towards the bottom	
130							@120cm: shell remnants, holes and dark spots	
140			pH=7.92;Eh=88 4.1Y/4.58/0.59			202	134-150cm: light grey medium sand with dark to black patches	140
150								

Station: **POS510-03GC** **Date:** **2017-03-10**

Target Latitude: **36°31.58'N** **Target Longitude:** **25°29.22'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	07:21	36°31.58'N	25°29.23'E	490m water depth, stop @ 420m, 1.2 m/s for entry
Ship @ bottom contact	07:33	36°31.580'N	25°29.216'E	boko @ 511m wire out, max. payout 516m, 17 kN on pulling

Remarks on recovery and material	Recovery: 065 cm Volcanoclastics overlaying dark grey baked mud and light grey silty layers which are baked and chemical altered, anhydrite?; Bottom Temperature: 96°C Pore fluid sampling @ 005cm (5.17pH, 171 Eh), 030cm (6.68pH, 167 Eh) Sediment sampling @ 010cm, 035cm, 055cm, 064cm, core catcher (finer and coarser grained pumice)

Station: **POS510-04GC** **Date:** **2017-03-10**

Target Latitude: **36°31.58'N** **Target Longitude:** **25°29.17'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	08:12	36°31.57'N	25°29.16'E	490m water depth, stop @ 420m, 1.2 m/s for entry
Ship @ bottom contact	08:22	36°31.58'N	25°29.18'E	boko @ 509 m wire out,max. payout 514m, 19-20 kN on pulling

Remarks on recovery and material	Recovery: 094 cm Fe-oxide overlying mixed silty sediment overlying coarse grained pumice Bottom Temperature: 27-28°C Pore fluid sampling @ 005cm (6.25pH, 146 Eh), 020cm (5.58 pH, 38 Eh, after cal.: 5.98 pH, 52 Eh), 035cm (5.99 pH, 15 Eh), 070cm Sediment sampling @ 000-007cm, 015-018cm, 035cm, 065-070cm, core catcher

Station: **POS510-05GC** **Date:** **2017-03-10**

Target Latitude: **36°31.58'N** **Target Longitude:** **25°29.10'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	08:54	36°31.37'N	25°29.10'E	490m water depth, stop @ 420m, 1.2 m/s for entry
Ship @ bottom contact	09:06	36°31.38'N	25°29.10'E	boko @ 510 m wire out, max. payout 515m, 15 kN on pulling
Ship @ station end	09:16	36°31.39'N	25°29.08'E	

Remarks on recovery and material	Recovery: 174 cm Pore fluid sampling @ 015cm (7.06pH, -40 Eh), 040cm (6.93pH, -110 Eh), 060cm (6.98 pH, -88 Eh), 070cm (6.96 pH, -111 Eh), 110cm (6.98 pH, -57 Eh @ 100cm), 120cm (7.17 pH, -125 Eh), 124cm (7.36 pH, -220 Eh), 160cm (6.81 pH, -76 Eh), 126cm, (6.80 pH, -47 Eh) Sediment sampling @ 015cm, 040cm, 060cm, 070cm, 100cm, 122cm, 125cm, 126cm, 160cm, core catcher

Station: **POS510-06GC** **Date:** **2017-03-10**

Target Latitude: **36°31.38'N** **Target Longitude:** **25°29.28'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	10:31	36°31.37'N	25°29.28'E	491m water depth, stop @ 420m, 1.2 m/s for entry
Ship @ bottom contact	10:43	36°31.38'N	25°29.28'E	boko @ 511 m wire out, max. payout 520m, 15 kN on pulling
Ship @ station end	10:54	36°31.38'N	25°29.27'E	

Remarks on recovery and material	Only little material in core catcher and section A. No pore fluid or geochemical sampling.

Station: **POS510-07GC** **Date:** **2017-03-10**
Station Poseidon: **POS510-06**

Target Latitude: **36°31.38'N** **Target Longitude:** **25°29.28'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	11:04	36°31.38'N	25°29.28'E	490m water depth, stop @ 420m, 1.2 m/s for entry
Ship @ bottom contact	11:15	36°31.38'N	25°29.27'E	boko @ 511 m wire out, max. payout 516m, 20 kN on pulling
Ship @ station end	11:26	36°31.39'N	25°29.27'E	

Remarks on recovery and material	Same spot as POS510-06GC Recovery: 090 cm Pore fluid sampling @ 001cm (6.98 pH, 121 Eh), 050cm (6.82pH, 84 Eh), 075cm, 085cm Sediment sampling @ 004cm, 050cm, 075-080cm, 085-088cm, core catcher

Station: **POS510-08GC** **Date:** **2017-03-10**
Station Poseidon: **POS510-07**

Target Latitude: **36°31.47'N** **Target Longitude:** **25°29.19'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	11:52	36°31.47'N	25°29.20'E	490m water depth, stop @ 420m, 1.2 m/s for entry
Ship @ bottom contact	12:06	36°31.47'N	25°29.20'E	boko @ 512 m wire out, max. payout 517m, 15 kN on pulling
Ship @ station end	12:18	36°31.46'N	25°29.20'E	

Remarks on recovery and material	Recovery: 195 cm Pore fluid sampling @ 028cm (6.81 pH, -44 Eh), 041cm (6.99pH, -57 Eh), 050cm (6.95 pH, -33 Eh), 060cm, 080cm (6.77 pH, -60 Eh) , 115cm (6.02 pH, no Eh value), 135cm (6.69 pH, -38 Eh), 160cm, 161cm (6.70 pH, -28 Eh), 164cm, 175cm (6.72 pH, -33 Eh), (@ 195 cm: 7.07 pH, 52 Eh, no pore fluid sample) Sediment sampling @ 033cm, 040cm, 048-050cm, 060cm, 080cm, 115cm, 135cm, 161cm, 164cm, 175cm, core catcher, bottom of section C in extra bag

Station: **POS510-09GC** **Date:** **2017-03-10**
Station Poseidon: **POS510-08**

Target Latitude: **36°31.58'N** **Target Longitude:** **25°29.22'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:47	36°31.59'N	25°29.23'E	490m water depth, stop @ 420m, 1.3 m/s for entry
Ship @ bottom contact	12:59	36°31.58'N	25°29.22'E	boko @ 510 m wire out, max. payout 515m, 20 kN on pulling
Ship @ station end	13:10	36°31.60'N	25°29.24'E	

Remarks on recovery and material	Recovery: 193 cm Bottom Temperature: 87°C Pore fluid sampling @ 010cm , 042cm, 080cm, 109cm , 130cm, 150cm, 170cm (@ 090cm: 6.39 pH, 144 Eh, no pore fluid sample) Sediment sampling @ 008-010cm, 040-042cm, 080-082cm, 109cm, 116cm, 160cm, core catcher, bottom of section C in extra bag

Station: **POS510-13GC** **Date:** **2017-03-12**
Station Poseidon: **POS510-12**

Target Latitude: **36°27.01'N** **Target Longitude:** **25°24.13'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	06:52	36°27.00'N	25°24.14'E	335m water depth, stop @ 150m, 1.2 m/s for entry
Ship @ bottom contact	07:00	36°27.01'N	25°24.10'E	boko @ 347 m wire out, max. payout 352m, 17 kN on pulling
Ship @ station end	07:20	36°27.03'N	25°24.157'E	

Remarks on recovery and material	Recovery: 047 cm Pore fluid sampling @ 005cm (7.19 pH, 147 Eh), 015cm (7.43 pH, -42 Eh), 030cm (7.69 pH, 152 Eh), 035cm (7.05 pH, 182 Eh), 042cm (6.44 pH, -91 Eh) Sediment sampling @ 000-005cm (Mn-crust), 003-005cm, 015cm, 030cm, 036cm, 043-045cm

Station: <u>**POS510-14GC**</u> **Date:** <u>**2017-03-12**</u>
Station Poseidon: <u>**POS510-13**</u>

Target Latitude: <u>**36°26.96'N**</u> **Target Longitude:** <u>**25°24.16'E**</u>

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	07:29	36°26.97'N	25°24.17'E	331m water depth, no oscillated needed, 1.2 m/s for entry
Ship @ bottom contact	07:35	36°26.96'N	25°24.16'E	boko @ 341 m wire out, max. payout 346m, 16 kN on pulling
Ship @ station end				

Remarks on recovery and material	Only little material in core catcher and section A. No pore fluid sampling.

Station: **POS510-15GC** **Date:** **2017-03-12**

Station Poseidon: **POS510-13**

Target Latitude: **36°26.96'N** **Target Longitude:** **25°24.16'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	07:59	36°26.96'N	25°24.18'E	330m water depth, 1.2 m/s for entry
Ship @ bottom contact	08:06	36°26.94'N	25°24.17'E	boko @ 340 m wire out, max. payout 345m, 17 kN on pulling
Ship @ station end	08:21	36°26.94'N	25°24.06'E	

Remarks on recovery and material	Recovery: 100 cm Bottom Temperature: 19°C Pore fluid sampling @ 020cm (6.80 pH, 147 Eh), 050cm (@ 052cm: 6.96 pH, 97 Eh in grey olive layer, 6.99 pH, 78 Eh in orange-yellow layer), 070cm (@074cm: 6.99 pH, 86 Eh), 090cm (@ 088cm: 7.03 pH, 106 Eh), (@ 044cm: 7.00 pH, 136 Eh, no pore fluid sampling) Sediment sampling @ 000-030cm (Mn-Crust), 020cm, 042cm, 051-052cm, 070cm, 090cm, core catcher, section B in extra bag

Station: **POS510-16GC** **Date:** **2017-03-12**
Station Poseidon: **POS510-14**

Target Latitude: **36°26.85'N** **Target Longitude:** **25°23.85'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	08:31	36°26.85'N	25°24.86'E	347m water depth, 1.1 m/s for entry
Ship @ bottom contact	08:40	36°26.85'N	25°23.85'E	boko @ 357 m wire out, max. payout 362m, 17 kN on pulling
Ship @ station end	08:56	36°26.86'N	25°23.90'E	

Remarks on recovery and material	Recovery: 042 cm Pore fluid sampling @ 020cm (7.23 pH, -59 Eh), 035cm (@ 037: 7.19 pH, 45 Eh), 040cm (7.31 pH, 98 Eh), (@ 004cm: 7.42 pH, 91 Eh, no pore fluid sample) Sediment sampling @ 005-008cm, 020cm, 035cm, 040cm

Station: **<u>POS510-17GC</u>** **Date:** **<u>2017-03-12</u>**
Station Poseidon: **<u>POS510-15</u>**

Target Latitude: **<u>36°26.85’N</u>** **Target Longitude:** **<u>25°24.15’E</u>**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	09:09	36°26.85’N	25°24.14’E	330m water depth, 1.2 m/s for entry
Ship @ bottom contact	09:15	36°26.86’N	25°24.17’E	boko @ 344 m wire out, max. payout 349m, 17 kN on pulling
Ship @ station end				

Remarks on recovery and material	Core catcher and little sample of section A in bag

Station: **POS510-16GC-B** **Date:** **2017-03-12**
Station Poseidon: **POS510-16**

Target Latitude: **36°26.85'N** **Target Longitude:** **25°23.85'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	10:33	36°27.01'N	25°24.07'E	340m water depth, 1.2 m/s for entry
Ship @ bottom contact	10:40	36°27.01'N	25°24.09'E	boko @ 348 m wire out, max. payout 353m, 14 kN on pulling
Ship @ station end				

Remarks on recovery and material	No sample!

Station: <u>**POS510-17GC-B**</u> **Date:** <u>**2017-03-12**</u>
Station Poseidon: <u>**POS510-17**</u>

Target Latitude: <u>**36°27.01'N**</u> **Target Longitude:** <u>**25°24.45'E**</u>

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	11:15	36°27.02'N	25°24.45'E	276m water depth, 1.4 m/s for entry
Ship @ bottom contact	11:21	36°27.01'N	25°24.44'E	boko @ 285 m wire out, max. payout 291m, 14 kN on pulling
Ship @ station end	11:31	36°27.04'N	25°24.45'E	

Remarks on recovery and material	Recovery: 057 cm Pore fluid sampling @ 010cm (7.34 pH, 150 Eh), 020cm (7.60 pH, 145 Eh), 030cm (@038cm: 7.20 pH, 216 Eh), 050cm (@ 046cm: 7.41 pH, 162 Eh) Sediment sampling @ 010cm, 020cm, 030cm, 036cm, 047-050cm, core catcher

Station: **POS510-18GC** **Date:** **2017-03-12**

Target Latitude: **36°27.20'N** **Target Longitude:** **25°24.46'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	11:51	36°27.20'N	25°24.46'E	218m water depth, 1.3 m/s for entry
Ship @ bottom contact	11:54	36°27.20'N	25°24.46'E	boko @ 227m wire out, max. payout 232m, 14 kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 300 cm Bottom Temperature: 21°C Pore fluid sampling @ 010cm (6.46 pH, 77 Eh), 040cm (6.20 pH, 70 Eh), 070cm (6.38 pH, 97 Eh), 085cm (@ 090cm, 6.92 pH, 107 Eh), 115cm (6.09 pH, 71 Eh), 125cm, 133cm (6.47 pH, 12 Eh), 160cm, 185cm, 205cm (@203cm: 7.07 pH, 86 Eh), 228cm (6.86 pH, 37 Eh), 245cm (6.50 pH, 103 Eh), 265cm (7.26 pH, 36 Eh), 280cm (6.82 pH, 165 Eh, repeated value: 7.32 pH, 88 Eh, @ 281cm: 6.89 pH, 173 Eh), (@ 074cm: 6.36 pH, 36 Eh, @ 192cm, 6.12 pH, 49 Eh, no pore fluid sample) Sediment sampling @ 010cm, 040cm, 070cm, 090cm, 092cm, 115cm, 125cm, 133cm, 160cm, 185cm, 205cm, 230cm, 245cm, 265cm, 280cm, 290-295cm, core catcher

Station: **POS510-19GC** **Date:** **2017-03-12**

Target Latitude: **36°27.19'N** **Target Longitude:** **25°24.30'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:25	36°27.19'N	25°24.30'E	255m water depth, 1.4 m/s for entry
Ship @ bottom contact	12:30	36°27.20'N	25°24.30'E	boko @ 260 m wire out, max. payout 265m, 14 kN on pulling
Ship @ station end				

Remarks on recovery and material	Miscellaneous crusts and one sample bag of section A, red brown mud-silt with mm-cm Fe-Mn-crusts

Station: **POS510-20GC** **Date:** **2017-03-12**

Target Latitude: **36°27.20'N** **Target Longitude:** **25°24.16'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:54	36°27.20'N	25°24.16'E	279m water depth, 1.4 m/s for entry
Ship @ bottom contact	13:00	36°27.21'N	25°24.15'E	boko @ 298 m wire out, max. payout 304m, 16 kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 300 cm Bottom Temperature: 20°C Pore fluid sampling @ 010 cm (6.51 pH, 149 Eh), 050cm (6.92 pH, 109 Eh), 065cm (6.26 pH, 145 Eh), 080cm (@ 075cm: 6.25 pH, 143 Eh), 110cm (6.10 pH, 89 Eh), 130cm (5.93 pH, 42 Eh), 150cm (6.33 pH, 62 Eh), 175cm (6.41 pH, 70 Eh), 195cm (6.54 pH, 82 Eh), 232cm (@ 235cm: 6.33 pH, 116 Eh), 265cm (6.32 pH, 86 Eh), 280cm (6.29 pH, 54 Eh) Sediment sampling @ 010cm, 030cm (Mn-crust in extra bag), 050cm, 065cm, 065cm (Mn-crust), 080cm, 110cm, 130cm, 150cm, 175cm, 195cm, 220cm, 260cm, 280cm

Station: **POS510-26GC** **Date:** **2017-03-14**

Target Latitude: **36°33.80'N** **Target Longitude:** **25°22.00'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	08:39	36°33.81'N	25°22.01'E	305m water depth, 1.2 m/s for entry
Ship @ bottom contact	08:42	36°33.80'N	25°22.01'E	boko @ 314 m wire out, max. payout 319m, 16 kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 086 cm Unclear sample! Pore fluid sampling @ 025cm (@ 030cm: 6.71 pH, 35 Eh), 045cm (7.09 pH, 64 Eh), 072cm (8.06 pH, 148 Eh), 080cm (@ 082cm: 7.93 pH, 105 Eh), (@ 010 cm: 7.35 pH, 132 Eh, @ 058cm: 7.68 pH, 207 Eh, @ 060cm: 7.55 pH, 191 Eh, @ 077cm: 7.84 pH, 147 Eh measured in WH, 8.34 pH, 95 Eh measured in AH, @ 084cm: 7.67 pH, 126 Eh, no pore fluid sample) Sediment sampling @ 025cm, 045cm, 060cm, 070cm, 077cm, 083cm

Station: **POS510-27GC** **Date:** **2017-03-14**

Target Latitude: **36°36.00'N** **Target Longitude:** **25°25.00'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	10:16	36°36.00'N	25°25.01'E	390m water depth, 1.3 m/s for entry
Ship @ bottom contact	10:24	36°26.02'N	25°25.01'E	boko @ 406 m wire out, max. payout 411m, 16 kN on pulling
Ship @ station end	10:36			

Remarks on recovery and material	Only core catcher sample! No geochemical or pore fluid sampling

Station: **POS510-28GC** **Date:** **2017-03-14**

Target Latitude: **36°38.00'N** **Target Longitude:** **25°30.00'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	11:32	36°37.95'N	25°30.00'E	420m water depth, 1.3 m/s for entry
Ship @ bottom contact	11:39	36°38.01'N	25°30.02'E	boko @ 436 m wire out, max. payout 442m, 16 kN on pulling
Ship @ station end				

Remarks on recovery and material	No sample!

Station: **POS510-29GC** **Date:** **2017-03-14**

Target Latitude: **36°41.00'N** **Target Longitude:** **25°36.00'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:43	36°40.97'N	25°36.04'E	454m water depth, 1.2 m/s for entry
Ship @ bottom contact	12:52	36°41.00'N	25°36.04'E	boko @ 470 m wire out, max. payout 476m, 15 kN on pulling
Ship @ station end	13:03	36°41.05´N	25°35.99'E	

Remarks on recovery and material	No sample!

Station: **POS510-36GC** **Date:** **2017-03-17**

Target Latitude: **36°40.00'N** **Target Longitude:** **25°37.50'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	06:10	36°40.00'N	25°37.53'E	471m water depth, 1.2 m/s for entry
Ship @ bottom contact	06:19	36°40.01'N	25°37.55'E	boko @ 490 m wire out, max. payout 495m, 15 kN on pulling
Ship @ station end				

Remarks on recovery and material	No sample. Little mud on the outside of cc. No deck measurements. No geochemical or pore fluid sampling

Station: **POS510-37GC** **Date:** **2017-03-17**

Target Latitude: **36°38.00'N** **Target Longitude:** **25°34.00'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	07:08	36°38.00'N	25°33.99'E	456m water depth, stop @ 400m (90sec. to oscillate) 1.2 m/s for entry
Ship @ bottom contact	07:17	36°38.00'N	25°33.99'E	boko @ 473 m wire out, max. payout 478m, 16 kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: ~7cm Corer showed light brown mud on the outside as sample. Temperature is 15 °C in sample. No deck measurements. No geochemical or pore fluid sampling

Station: **POS510-38GC** **Date:** **2017-03-17**

Target Latitude: **36°36.70'N** **Target Longitude:** **25°33.50'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	07:52	36°36.70'N	25°33.52'E	380m water depth, stop @ 320m 1.2 m/s for entry
Ship @ bottom contact	08:00	36°36.71'N	25°33.53'E	boko @ 396 m wire out, max. payout 402m, 17 kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 125cm Pore fluid sampling @ 028cm (6.91 pH, 240 Eh), 035cm (@ 037cm: 7.60 pH, 206 Eh), 045cm, 090cm, 110cm (7.77 pH, 167 Eh), (@ 050cm: 7.47 pH, 187 Eh, @ 080cm: 7.84 pH, 151 Eh, no pore fluid sample) Sediment sampling @ 003-005cm, 028cm, 035cm, 045cm, 080cm, 095cm, 110cm, 2 samples of core catcher

Station: **POS510-39GC** **Date:** **2017-03-17**

Target Latitude: **36°36.30'N** **Target Longitude:** **25°33.50'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	**1.** 08:32 **2.** 08:50	36°36.31'N 36°36.31'N	25°33.50'E 25°33.49'E	**1. and 2.** 444m water depth, stop @ 400m 1.2 m/s for entry.
Ship @ bottom contact	**1.** 08:40 **2.** 09:00	36°36.31'N 36°36.31'N	25°33.50'E 25°33.49'E	**1.** boko @ 462m wire out, max. payout 467m, 15 kN on pulling **2.** boko @ 461m wire out, max. payout 466m, 14 kN on pulling
Ship @ station end				
Remarks on recovery and material	**1.:** no sample. **2.:** no sample			

Station: **POS510-40GC** **Date:** **2017-03-17**

Target Latitude: **36°35.70'N** **Target Longitude:** **25°33.50'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	10:30	36°35.70'N	25°33.51'E	435m water depth, stop @ 380m 1.2 m/s for entry
Ship @ bottom contact	10:41	36°35.69'N	25°33.49'E	boko @ 452m wire out, max. payout 459m, 15 kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: ~010cm No geochemical or pore fluid sampling

Station: **POS510-41GC** **Date:** **2017-03-17**

Target Latitude: **36°36.10’N** **Target Longitude:** **25°33.73’E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	11:00	36°36.11’N	25°33.74’E	373m water depth, stop @ 330m 1.2 m/s for entry
Ship @ bottom contact	11:07	36°36.08’N	25°33.73’E	boko @ 350m wire out, max. payout 355m, 12 kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 053cm Pore fluid sampling @ 010cm (7.57 pH, 213 Eh), 030cm, 050cm, (@ 022cm: 7.56 pH, 226 Eh, @ 040cm: 7.63 pH, 205 Eh, no pore fluid sample) Sediment sampling @ 010cm, 030cm, 050cm, core catcher

Station: **POS510-42GC** **Date:** **2017-03-17**

Target Latitude: **36°36.71'N** **Target Longitude:** **25°33.36'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	11:35	36°36.71'N	25°33.36'E	360m water depth, stop @ 320m 1.2 m/s for entry
Ship @ bottom contact	11:45	36°36.71'N	25°33.37'E	boko @ 384m wire out, max. payout 389m, 17 kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 051cm Pore fluid sampling @ 020cm (6.97 pH, 240 Eh), 045cm (7.73 pH, 143 Eh), (@ 032cm: 7.69 pH, 180 Eh, no pore fluid sample) Sediment sampling @ 020cm, 045cm, core catcher

Station: **POS510-43GC** **Date:** **2017-03-17**

Target Latitude: **36°36.31'N** **Target Longitude:** **25°33.00'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:08	36°36.30'N	25°32.97'E	400m water depth, stop @ 350m 1.2 m/s for entry
Ship @ bottom contact	12:18	36°36.31'N	25°33.00'E	boko @ 429m wire out, max. payout 434m, 19 kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 300 cm Pore fluid sampling @ 010cm (7.65 pH, 187 Eh), 030cm (7.79 pH, 36 Eh), 070cm (7.70 pH, -16 Eh), 090cm (7.96 pH, -28 Eh), 185cm (@ 180cm: 8.04 pH, 159 Eh), 195cm (7.98 pH, 28 Eh), 220cm (7.83 pH, -60 Eh), 260cm (7.63 pH, 180 Eh), (@ 140cm: 7.70 pH, -81 Eh, no pore fluid sample) Sediment sampling @ 010cm, 030cm, 070cm, 090cm, 185cm, 180-190cm (pumice clasts), 195cm, 220cm, 260cm, core catcher

Station: **POS510-44GC** **Date:** **2017-03-17**

Target Latitude: **36°35.00'N** **Target Longitude:** **25°33.50'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:49	36°34.99'N	25°33.50'E	450m water depth, stop @ 400m 1.3 m/s for entry
Ship @ bottom contact	12:59	36°35.00'N	25°33.51'E	boko @ 465m wire out, max. payout 470m, 15 kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: ~010cm No geochemical or pore fluid sampling

Station: **POS510-45GC** **Date:** **2017-03-17**

Target Latitude: **36°34.50'N** **Target Longitude:** **25°34.20'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	13:29	36°34.44'N	25°34.17'E	451m water depth, stop @ 400m 1.4 m/s for entry
Ship @ bottom contact	13:38	36°34.49´N	25°34.18'E	boko @ 468m wire out, max. payout 474m, 15 kN on pulling
Ship @ station end				
Remarks on recovery and material	Recovery: ~010cm No geochemical or pore fluid sampling			

Station: **POS510-47GC** **Date:** **2017-03-18**

Target Latitude: **36°35.16'N** **Target Longitude:** **25°23.29'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	07:26	36°35.17'N	25°23.27'E	361m water depth, stop @ 310m 1.2 m/s for entry
Ship @ bottom contact	07:33	36°35.15'N	25°23.30'E	boko @ 372m wire out, max. payout 377m, 13 kN on pulling
Ship @ station end				
Remarks on recovery and material	No sample!			

Station: **POS510-48GC** **Date:** **2017-03-18**

Target Latitude: **36°35.31'N** **Target Longitude:** **25°22.63'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	08:23	36°35.30'N	25°22.63'E	325m water depth, stop @ 280m 1.2 m/s for entry
Ship @ bottom contact	08:30	36°35.32'N	25°22.60'E	boko @ 335m wire out, max. payout 340m, 12 kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 027cm CC: grey sediment. Section A: greyish-brownish sediment. No geochemical or pore fluid samples. Core 48GC and core 49GC are stored in same D-tube

Station: **POS510-49GC** **Date:** **2017-03-18**

Target Latitude: **36°34.99'N** **Target Longitude:** **25°22.55'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	08:58	36°34.98'N	25°22.56'E	321m water depth, stop @ 280m 1.2 m/s for entry
Ship @ bottom contact	09:05	36°34.98'N	25°22.53'E	boko @ 328m wire out, max. payout 333m, 13 kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 037cm CC grayish sediment. No geochemical or pore fluid samples. Core 48GC and core 49GC are stored in same D-tube

Station: **POS510-50GC** **Date:** **2017-03-18**

Target Latitude: **36°33.80'N** **Target Longitude:** **25°22.00'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	10:34	36°33.78'N	25°22.05'E	306m water depth, stop @ 260m 1.2 m/s for entry
Ship @ bottom contact	10:41	36°33.80'N	25°21.98'E	boko @ 312m wire out, max. payout 317m, 12 kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 035cm CC grayish sediment. Brown sediment on section A No geochemical or pore fluid sampling

Station: **POS510-51GC** **Date:** **2017-03-18**

Target Latitude: **36°32.63'N** **Target Longitude:** **25°24.77'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	**1.** 11:24 **2.** 11:45 **3.** 12:19	36°32.62'N 36°32.65'N 36°32.62'N	25°24.73'E 25°24.69'E 25°24.75'E	**1. and 2.** 381m water depth, stop @ 330m 1.3 m/s for entry, **3.** 381m water depth, 1.6 m/s for entry
Ship @ bottom contact	**1.** 11:34 **2.** 11:53 **3.** 12:27	36°32.63'N 36°32.62'N 36°32.64'N	25°24.73'E 25°24.74'E 25°24.75'E	**1. and 2.** boko @ 394m wire out, max. payout 400m, 11 kN on pulling, **3.** boko @ 394m wire out, max. payout 401m, 12kN
Ship @ station end				
Remarks on recovery and material	**1.** No sample **2.** Recovery: ~008 cm in sample bag. No geochemical or pore fluid sampling **3.** No sample			

Station: **POS510-52GC** **Date:** **2017-03-18**

Target Latitude: **36°32.04'N** **Target Longitude:** **25°24.78'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	**1.** 13:01 **2.** 13:22	36°32.01'N 36°32.04'N	25°24.75'E 25°24.79'E	**1.** 297m water depth, stop @ 250m 1.2 m/s for entry **2.** 297m water depth, stop @ 250m 0.5 m/s for entry
Ship @ bottom contact	**1.** 13:12 **2.** 13:30	36°32.04'N 36°32.03'N	25°24.76'E 25°24.76'E	**1.** boko @ 311m wire out, max. payout 316m, 11 kN on pulling **2.** boko @ 317m wire out, max. payout 322m, 11 kN on pulling
Ship @ station end				

Remarks on recovery and material	**1.** No sample! **2.** Recovery: ~007cm, ~020cm cc. No geochemical or pore fluid sampling

Station: **POS510-54GC** **Date:** **2017-03-19**

Target Latitude: **36°32.00'N** **Target Longitude:** **25°45.00'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	**1.** 08:33 **2.** 08:57	36°32.01'N 36°31.99'N	25°45.02'E 25°44.99'E	650m water depth, 1.2 m/s for entry
Ship @ bottom contact	**1.** 08:44 **2.** 09:08	36°32.00'N 36°32.01'N	25°45.02'E 25°44.99'E	**1.** boko @ 676m wire out, max. payout 681m, 18 kN on pulling **2.** boko @ 675m wire out, max. payout 681m, 16 kN on pulling
Ship @ station end				

Remarks on recovery and material	No sample!

Station: **POS510-55GC** **Date:** **2017-03-19**

Target Latitude: **36°36.00'N** **Target Longitude:** **25°46.50'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	10:30	36°36.03'N	25°46.53'E	696m water depth, 1.2 m/s for entry
Ship @ bottom contact	10:42	36°36.01'N	25°46.47'E	boko @ 724m wire out, max. payout 730m,
Ship @ station end				
Remarks on recovery and material	Recovery: ~008cm, ~001cm cc No geochemical or pore fluid sampling			

Station: **POS510-56GC** **Date:** **2017-03-19**

Target Latitude: **36°42.00'N** **Target Longitude:** **25°48.00'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:15	36°41.98'N	25°48.04'E	432m water depth, stop @ 380m, 0.8 m/s for entry
Ship @ bottom contact	12:25	36°42.02'N	25°47.98'E	boko @ 452m wire out, max. payout 457m, 20kN on pulling
Ship @ station end				
Remarks on recovery and material	Recovery: 180cm Pore fluid sampling @ 010cm (7.66 pH, 168 Eh), 025cm, 045cm (7.01 pH, error measurement for Eh), 066cm, 082cm (@ 080cm: 7.77 pH, -91 Eh), 120cm (@ 122cm: 7.90 pH, -45 Eh), 160cm (7.78 pH, -30 Eh) Sediment sampling @ 010cm, 025cm, 045cm, 067cm, 080cm, 125cm, 160cm, core catcher			

Station: **POS510-59GC** **Date:** **2017-03-20**

Target Latitude: **36°30.58'N** **Target Longitude:** **25°26.53'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	06:03	36°30.59'N	25°26.54'E	363m water depth, 1.2 m/s for entry
Ship @ bottom contact	06:10	36°30.59'N	25°26.53'E	boko @ 379m wire out, max. payout 384m, 19kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 300cm Pore fluid sampling @ 005cm (7.60 pH, 140 Eh), 050cm (7.79 pH, 36 Eh), 090cm (7.46 pH, 126 Eh), 130cm (@ 127cm: 7.67 pH, 96 Eh), 175cm (7.59 pH, 58 Eh), 230cm (7.55 pH, -35 Eh), 290cm (7.54 pH, -29 Eh), (@ 010cm: 7.88 pH, 112 Eh, @ 040cm: 7.69 pH, 122 Eh, no pore fluid sample) Sediment sampling @ 005cm, 050cm, 090cm, 130cm, 175cm, 190cm, 230cm, 290cm

Station: **POS510-60GC** **Date:** **2017-03-20**

Target Latitude: **36°30.31'N** **Target Longitude:** **25°26.88'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	06:44	36°30.31'N	25°26.88'E	341m water depth, 1.2 m/s for entry
Ship @ bottom contact	06:49	36°30.29'N	25°26.87'E	boko @ 353m wire out, max. payout 358m, 12kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: ~010cm, cc ~002cm No geochemical or pore fluid sampling

Station: **POS510-61GC** **Date:** **2017-03-20**

Target Latitude: **36°30.08'N** **Target Longitude:** **25°26.76'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	07:24	36°30.12'N	25°26.77'E	343m water depth, 1.2 m/s for entry
Ship @ bottom contact	07:32	36°30.09'N	25°26.77'E	boko @ 355m wire out, max. payout 360m, 12kN on pulling
Ship @ station end				
Remarks on recovery and material	Recovery: ~015cm, cc ~001cm No geochemical or pore fluid sampling			

Station: **POS510-62GC** **Date:** **2017-03-20**

Target Latitude: **36°30.61'N** **Target Longitude:** **25°27.43'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	08:10	36°30.62'N	25°27.42'E	184m water depth, 0.8 m/s for entry
Ship @ bottom contact	08:14	36°30.62'N	25°27.42'E	boko @ 189m wire out, max. payout 194m, 10kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: ~007cm, cc ~001-002cm No geochemical or pore fluid sampling

Station: **POS510-63GC** **Date:** **2017-03-20**

Target Latitude: **36°29.86’N** **Target Longitude:** **25°27.34’E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	08:41	36°29.85’N	25°27.36’E	291m water depth, 1.2 m/s for entry
Ship @ bottom contact	08:46	36°29.85’N	25°27.33’E	boko @ 301m wire out, max. payout 306m, 14kN on pulling
Ship @ station end				
Remarks on recovery and material	Recovery: 100cm Thin yellowish-brown Fe-staining silt layer overlaying medium light grey mud with few pumice clasts in coarser grained layers. Pore fluid sampling @ 004cm (7.57 pH, 61 Eh), 020cm (7.68 pH, 32 Eh), 025cm, 060cm (7.51 pH, -25 Eh), Sediment sampling @ 005cm, 020cm, 025cm, 060cm, core catcher			

Station: **POS510-64GC** **Date:** **2017-03-20**

Target Latitude: **36°29.75'N** **Target Longitude:** **25°27.13'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	09:12	36°29.75'N	25°27.13'E	293m water depth, 1.2 m/s for entry
Ship @ bottom contact	09:17	36°29.74'N	25°27.14'E	boko @ 301m wire out, max. payout 306m, 13kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: ~008cm No geochemical or pore fluid sampling

Station: **POS510-65GC** **Date:** **2017-03-20**

Target Latitude: **36°29.51'N** **Target Longitude:** **25°26.53'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	10:31	36°29.51'N	25°26.53'E	296m water depth, 1.2 m/s for entry
Ship @ bottom contact	10:36	36°29.48'N	25°26.50'E	boko @ 307m wire out, max. payout 312m, 13kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: ~003cm. cc ~004cm No geochemical or pore fluid sampling

Station: **POS510-66GC** **Date:** **2017-03-20**

Target Latitude: **36°29.23'N** **Target Longitude:** **25°26.50'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	11:05	36°29.23'N	25°26.50'E	258m water depth, 0.8 m/s for entry
Ship @ bottom contact	11:11	36°29.24'N	25°26.52'E	boko @ 260m wire out, max. payout 265m, 11kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: only cc ~016cm No geochemical or pore fluid sampling

Station: **POS510-67GC** **Date:** **2017-03-20**

Target Latitude: **36°29.08'N** **Target Longitude:** **25°26.84'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	11:38	36°29.07'N	25°26.84'E	247m water depth, 1.4 m/s for entry
Ship @ bottom contact	11:43	36°29.06'N	25°26.86'E	boko @ 258m wire out, max. payout 263m, 14kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 090cm, only AH was filled Thin yellowish-brown Fe-staining silt layer overlaying medium light grey mud with few sandy patches (volcanoclastics?). Pore fluid sampling @ 040cm (7.46 pH, -69 Eh), 080cm (7.95 pH, 37 Eh) Sediment sampling @ 040cm, 080cm

Station: **POS510-68GC** **Date:** **2017-03-20**

Target Latitude: **36°31.64'N** **Target Longitude:** **25°29.26'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:27	36°31.65'N	25°29.26'E	480m water depth, 1.4 m/s for entry
Ship @ bottom contact	12:35	36°31.66'N	25°29.28'E	boko @ 503m wire out, max. payout 509m, 15kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: ~010cm in sample bag Small pumice pieces with one big clast. No geochemical or pore fluid sampling

Station: **POS510-69GC** **Date:** **2017-03-20**

Target Latitude: **36°31.66'N** **Target Longitude:** **25°29.19'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:56	36°31.66'N	25°29.19'E	477m water depth, 1.2 m/s for entry
Ship @ bottom contact	13:05	36°31.64'N	25°29.18'E	boko @ 501m wire out, max. payout 506m, 18kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 078cm Iron-oxide rich mixed layer overlaying coarse grain heterogeneous pumice overlaying dark grey sandy sulfide bearing material (63-78cm). Pore fluid sampling @ 025cm, 063cm, 070cm (6.52 pH, 138 Eh), (@ 008cm: 7.54 pH, 134 Eh, no pore fluid sample) Sediment sampling @ 008cm, 025cm, 062cm, 070cm, core catcher

Station: **POS510-70GC** **Date:** **2017-03-20**

Target Latitude: **36°31.59'N** **Target Longitude:** **25°29.19'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	13:29	36°31.59'N	25°29.19'E	490m water depth, 1.2 m/s for entry
Ship @ bottom contact	13:37	36°31.58'N	25°29.20'E	boko @ 510m wire out, max. payout 515m, 18kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 100cm + 2 sample bags of section B (ca. 40 cm) Medium dark grey clast (mm-5cm size) supported mud overlaying small pumice clasts with silty matrix. Bottom Temperature: 54°C Pore fluid sampling @ 010cm, 070cm, 095cm (@ 098cm: 6.70 pH, -29 Eh), (@ 005cm: 6.00 pH, -37 Eh, @050cm: 5.97 pH, -14 Eh, no pore fluid sample) Sediment sampling @ 010cm, 030cm, 070cm, 093cm, 095cm, core catcher

Station: **POS510-73-2GC** **Date:** **2017-03-21**

Target Latitude: **36°25.00’N** **Target Longitude:** **25°41.70’E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	11:22	36°25.01’N	25°41.70’E	556m water depth, 1.0 m/s for entry
Ship @ bottom contact	11:33	36°25.02’N	25°41.69’E	boko @ 578m wire out, max. payout 584m, 15kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 051cm Light brownish tinge layer overlaying beige homogenous silt material. Core catcher and core recovery stored in same D-tube. Pore fluid sampling @ 005cm (7.51 pH, 170 Eh), 030cm (7.63 pH, 173 Eh), 040cm (7.31 pH, 158 Eh), (@ 022cm: 7.85 pH, 180 Eh, no pore fluid sample) Sediment sampling @ 005cm, 020cm, 030cm, 040cm

Station: **POS510-74GC** **Date:** **2017-03-21**

Target Latitude: **36°28.00'N** **Target Longitude:** **25°45.00'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:32	36°27.99'N	25°45.04'E	604m water depth, 1.0 m/s for entry
Ship @ bottom contact	12:43	36°28.00'N	25°45.04'E	boko @ 627m wire out, max. payout 633m, 16kN on pulling
Ship @ station end				
Remarks on recovery and material	Recovery: ~005cm No geochemical or pore fluid sampling			

Station: **POS510-76GC** **Date:** **2017-03-22**

Target Latitude: **36°39.69'N** **Target Longitude:** **25°36.84'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	07:36	36°39.70'N	25°36.88'E	440m water depth, stop @ 380m, 1.2 m/s for entry
Ship @ bottom contact	07:45	36°39.73'N	25°36.84'E	boko @ 455m wire out, max. payout 460m, 14kN on pulling
Ship @ station end				
Remarks on recovery and material	No sample			

Station: **POS510-77GC** **Date:** **2017-03-22**

Target Latitude: **36°38.19'N** **Target Longitude:** **25°35.10'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	**1.** 08:28 **2.** 08:47	36°38.20'N 36°38.20'N	25°35.08'E 25°35.12'E	**1.** 443m water depth, stop @ 380m, 1.2 m/s for entry **2.** 443m water depth, 0.8 m/s for entry
Ship @ bottom contact	**1.** 08:36 **2.** 08:54	36°38.20'N 36°38.19'N	25°35.09'E 25°35.11'E	**1.** boko @ 461m wire out, max. payout 467m, 14kN on pulling **2.** boko @ 457m wire out, max. payout 462m, 14kN on pulling
Ship @ station end				

Remarks on recovery and material	**1.** No sample **2.** No sample

Station: **POS510-78GC** **Date:** **2017-03-22**

Target Latitude: **36°37.41'N** **Target Longitude:** **25°34.71'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	10:15	36°37.41'N	25°34.67'E	406m water depth, stop @ 380m, 1.2 m/s for entry
Ship @ bottom contact	10:24	36°37.40'N	25°34.70'E	boko @ 426m wire out, max. payout 431m, 19kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 133cm Layered beige-yellowish-brown mud with light olive grey, reduced clay layer pervaded with grey striation (58-76cm) and thin reduced wet silty layer from 85-87cm with an angle. Pore fluid sampling @ 013cm (7.81 pH, 142 Eh), 040cm (7.54 pH, 147 Eh), 070cm (7.73 pH, 14 Eh), 088cm (@ 090cm: 7.82 pH, -61 Eh), 110cm, (7.45 pH, 100 Eh), (@ 004cm: 7.82 pH, 141 Eh, no pore fluid sample) Sediment sampling @ 004cm, 013cm, 040cm, 070cm, 086-090cm, 110cm, 130cm, core catcher

Station: **POS510-79-1GC**
POS510-79-2GC

Date: **2017-03-22**

Target Latitude: **36°36.66'N**

Target Longitude: **25°33.42'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	**1.** 11:08 **2.** 11:37	36°36.67'N 36°36.65'N	25°33.44'E 25°33.43'E	**1.** 352m water depth, stop @ 300m, 1.2 m/s for entry **2.** 353m water depth, stop @ 300m, 0.5 m/s for entry
Ship @ bottom contact	**1.** 11:22 **2.** 11:47	36°36.67'N 36°36.65'N	25°33.42'E 25°33.42'E	**1.** boko @ 368m wire out, max. payout 373m, 14kN on pulling **2.** boko @ 368m wire out, max. payout 373m, 14kN on pulling
Ship @ station end				

Remarks on recovery and material	**1.** Recovery: ~005cm **2.** Recovery: 075cm Iron-oxide rich semiliquid clay layer overlaying with homogenous light grey clay with few darker spots and light sulpHur smell. Pore fluid sampling @ 005cm (7.67 pH, 155 Eh), 025cm, 060cm (6.37 pH, 189 Eh), (@ 010cm: 7.54 pH, 123 Eh, no pore fluid sample) Sediment sampling @ 005m, 025cm, 060cm, core catcher

Station: **POS510-80GC** **Date:** **2017-03-22**

Target Latitude: **36°36.02'N** **Target Longitude:** **25°33.81'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:20	36°36.02'N	25°33.77'E	294m water depth, stop @ 250m, 1.2 m/s for entry
Ship @ bottom contact	12:28	36°36.04'N	25°33.81'E	boko @ 305m wire out, max. payout 312m, 11kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 027cm (012cm core sample, 015cm cc) Yellowish-brown mud with few small clasts over defuses layering of yellowish-brown and dark grey to brown bands. Mostly sandy material. No geochemical or pore fluid samples. WH and AH in one D-tube

Station: **POS510-87GC** **Date:** **2017-03-24**

Target Latitude: **36°31.50'N** **Target Longitude:** **25°29.38'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	06:57	36°31.50'N	25°29.35'E	490m water depth, 1.2 m/s for entry
Ship @ bottom contact	07:06	36°31.48'N	25°29.35'E	boko @ 511m wire out, max. payout 516m, 16kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 180cm Pore fluid sampling @ 001cm (7.67 pH, 155 Eh), 045cm (6.95 pH, -148 Eh), 064cm (7.08 pH, -131 Eh), 075cm (@ 076cm: 7.11 pH, -62 Eh), 100cm (7.00 pH, -167 Eh, @ 099cm: 6.93 pH, -12 Eh), 150cm (7.16 pH, -98 Eh), 179cm (7.50 pH, -144 Eh) Sediment sampling @ 001cm, 045cm, 064cm, 075cm, 100cm, 150cm, 179cm, core catcher

Station: **POS510-88GC** **Date:** **2017-03-24**

Target Latitude: **36°31.30'N** **Target Longitude:** **25°29.33'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	**1.** 07:35 **2.** 07:58	36°31.31'N 36°31.30'N	25°29.34'E 25°29.30'E	**1.** 488m water depth, 1.2 m/s for entry **2.** 488m water depth, stop @ 460m, 1.0 m/s for entry
Ship @ bottom contact	**1.** 07:44 **2.** 08:09	36°31.30'N 36°31.30'N	25°29.30'E 25°29.31'E	**1.** boko @ 507m wire out, max. payout 513m, 16kN on pulling **2.** boko @ 507m wire out, max. payout 514m, 16kN on pulling
Ship @ station end				

Remarks on recovery and material	**1.** Recovery: cc ~002cm **2.** Recovery: 017cm No pore fluid or geochemical sampling

Station: **POS510-89GC** **Date:** **2017-03-24**

Target Latitude: **36°31.30'N** **Target Longitude:** **25°29.22'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	**1.** 08:31 **2.** 08:57	36°31.29'N 36°31.29'N	25°29.23'E 25°29.21'E	**1.** 488m water depth, stop @ 450m, 1.0 m/s for entry **2.** 488m water depth, 1.2 m/s for entry
Ship @ bottom contact	**1.** 08:41 **2.** 09:04	36°31.30'N 36°31.30'N	25°29.20'E 25°29.21'E	**1.** boko @ 505m wire out, max. payout 510m, 14kN on pulling **2.** boko @ 505m wire out, max. payout 510m, 16kN on pulling
Ship @ station end				

Remarks on recovery and material	**1.** Recovery: ~001-002cm **2.** Recovery: 068cm Pore fluid sampling @ 065cm Sediment sampling @ 042cm, 065cm, core catcher

Station: **POS510-90-1GC**
POS510-90-2GC
POS510-90-3GC

Date: **2017-03-24**

Target Latitude: **36°31.30'N**

Target Longitude: **25°29.08'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	**1.** 10:31 **2.** 10:55 **3.** 11:23	36°31.31'N 36°31.31'N 36°31.31'N	25°29.08'E 25°29.08'E 25°29.08'E	**1.** 486m water depth, stop @ 450m, 1.2 m/s for entry **2.** 485m water depth, 1.0 m/s for entry **3.** 485m water depth, 1.4 m/s for entry
Ship @ bottom contact	**1.** 10:40 **2.** 11:03 **3.** 11:32	36°31.31'N 36°31.32'N 36°31.32'N	25°29.07'E 25°29.07'E 25°29.09'E	**1.** boko @ 502m wire out, max. payout 508m, 15kN on pulling **2.** boko @ 504m wire out, max. payout 510m, 15kN on pulling **3.** boko @ 504m wire out, max. payout 508m, 15kN on pulling

Remarks on recovery and material	**1.** no sample **2.** Recovery: ~010cm, no geochemical or pore fluid sampling **3.** Recovery: ~035cm Pore fluid sampling @ 030cm (7.67 pH, 155 Eh) Sediment sampling @ 008cm, 030cm, core catcher of 2. and 3.

Station: **POS510-91GC** **Date:** **2017-03-24**

Target Latitude: **36°31.50'N** **Target Longitude:** **25°29.08'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:00	36°31.52'N	25°29.04'E	491m water depth, 1.4 m/s for entry
Ship @ bottom contact	12:08	36°31.51'N	25°29.08'E	boko @ 509m wire out, max. payout 514m, 16kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 185cm Pore fluid sampling @ 020cm (6.86 pH, -74 Eh), 060cm, 070cm (6.82 pH, -48 Eh), 105cm (6.76 pH, 78 Eh), 120cm, 150cm (6.75 pH, -83 Eh), 175cm (6.21 pH, -7 Eh) (@ 030cm: 7.07 pH, -73 Eh, @115cm: 7.34 pH, -75 Eh, no pore fluid sample) Sediment sampling @ 020cm, 060cm, 070cm, 105cm, 120cm, 150cm, 175cm

Station: **POS510-92GC** **Date:** **2017-03-24**

Target Latitude: **36°31.58'N** **Target Longitude:** **25°29.23'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:51	36°31.58'N	25°29.22'E	491m water depth, 1.4 m/s for entry
Ship @ bottom contact	13:00	36°31.60'N	25°29.20'E	boko @ 509m wire out, max. payout 515m, 20kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 190cm Bottom Temperature: 99°C Pore fluid sampling @ 030cm (5.93 pH, 22 Eh), 075cm, 100cm (6.42 pH, 12 Eh), 147cm (6.73 pH, 32 Eh), 170cm (6.86 pH, 64 Eh), (@035cm: 5.93 pH, -5 Eh, @ 065cm: 6.05 pH, 20 Eh, no pore fluid sampling) Sediment sampling @ 030cm, 075cm, 090cm, 100cm, 130cm, 147cm, 170cm

Station: **POS510-93GC** **Date:** **2017-03-24**

Target Latitude: **36°31.64'N** **Target Longitude:** **25°29.22'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	**1.** 13:38 **2.** 14:01	36°31.60'N 36°31.63'N	25°29.22'E 25°29.21'E	**1.** 489m water depth, 1.4 m/s for entry **2.** 484m water depth, 1.4 m/s for entry
Ship @ bottom contact	**1.** 13:46 **2.** 14:09	36°31.64'N 36°31.64'N	25°29.23'E 25°29.21'E	**1.** boko @ 505m wire out, max. payout 511m, 15kN on pulling **2.** boko @ 506m wire out, max. payout 512m, 15kN on pulling
Ship @ station end				

Remarks on recovery and material	**1.** Recovery: ~007cm **2.** Recovery: 045cm Bottom Temperature: 19°C Pore fluid sampling @ 040cm (@ 041cm: 7.22 pH, -19 Eh), (@ 007cm: 7.07 pH, -126 Eh, no pore fluid sampling) Sediment sampling @ 008cm, 040cm

Station: **POS510-95GC** **Date:** **2017-03-25**

Target Latitude: **36°24.71'N** **Target Longitude:** **25°21.68'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	07:48	36°24.71'N	25°21.69'E	230m water depth, 1.2 m/s for entry
Ship @ bottom contact	07:52	36°24.71'N	25°21.68'E	boko @ 235m wire out, max. payout 240m, 10kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: ~020 cm No geochemical or pore fluid sampling

Station: **POS510-96-1GC** **Date:** **2017-03-25**

Target Latitude: **36°24.43'N** **Target Longitude:** **25°21.64'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	08:18	36°24.43'N	25°21.66'E	290m water depth, stop @ 250m, 1.2 m/s for entry
Ship @ bottom contact	08:25	36°24.42'N	25°21.65'E	boko @ 320m wire out, max. payout 325m, 14kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 078cm Pore fluid sampling @ 004cm (@ 005cm: 7.38 pH, 119 Eh), 028cm (7.14 pH, 130 Eh), 049cm (@ 048cm: 7.35 pH, 142 Eh), 065cm (7.04 pH, 127 Eh) Sediment sampling @ 004cm, 028cm, 049cm, 064cm, core catcher

Station: **POS510-96-2GC** **Date:** **2017-03-25**

Target Latitude: **36°24.43'N** **Target Longitude:** **25°21.64'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	08:43	36°24.43'N	25°21.65'E	290m water depth, stop @ 250m, 1.2 m/s for entry
Ship @ bottom contact	08:50	36°24.43'N	25°21.64'E	boko @ 321m wire out, max. payout 326m, 12kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 087cm Bottom Temperature: 20°C Pore fluid sampling @ 023cm (@ 024cm: 6.93 pH, 162 Eh), 045cm, (6.83 pH, 169 Eh), (@ 009cm: 6.68 pH, 164 Eh, no pore fluid sampling) Sediment sampling @ 009cm, 025cm, 045cm, 075cm, core catcher

Station: **POS510-97GC** **Date:** **2017-03-25**

Target Latitude: **36°24.58’N** **Target Longitude:** **25°21.66’E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	09:13	36°24.58’N	25°21.66’E	242m water depth, 1.2 m/s for entry
Ship @ bottom contact	09:18	36°24.58’N	25°21.66’E	boko @ 237m wire out, max. payout 242m, 12kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 030cm Pore fluid sampling @ 020cm (7.55 pH, -76 Eh) Sediment sampling @ 006cm, 020cm, core catcher

Station: **POS510-98GC** **Date:** **2017-03-25**

Target Latitude: **36°24.28'N** **Target Longitude:** **25°21.63'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	10:29	36°24.28'N	25°21.63'E	312m water depth, 1.2 m/s for entry
Ship @ bottom contact	10:36	36°24.27'N	25°21.61'E	boko @ 324m wire out, max. payout 330m, 12kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery:030cm Pore fluid sampling @ 020cm (7.75/7.61 pH, -64/-79 Eh) Sediment sampling @ 020cm, core catcher

Station: **POS510-99GC** **Date:** **2017-03-25**

Target Latitude: **36°23.25'N** **Target Longitude:** **25°22.14'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	**1.** 11:22 **2.** 11:36	36°23.24'N 36°23.25'N	25°22.13'E 25°22.14'E	**1.** 248m water depth, 1.2 m/s for entry **2.** 240m water depth, 1.4 m/s for entry
Ship @ bottom contact	**1.** 11:28 **2.** 11:40	36°23.24'N 36°23.24'N	25°22.14'E 25°22.13'E	**1.** boko @ 288m wire out, max. payout 294m, 12kN on pulling **2.** boko @ 263m wire out, max. payout 267m, 10kN on pulling
Ship @ station end				

Remarks on recovery and material	**1.** no sample **2.** Recovery: 027cm Pore fluid sampling @ 018cm (@ 020cm: 7.82 pH, -66 Eh) Sediment sampling @ 020cm, core catcher (clasts and sediment)

Station: **POS510-100GC** **Date:** **2017-03-25**

Target Latitude: **36°23.14'N** **Target Longitude:** **25°22.05'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:11	36°23.10'N	25°22.10'E	275m water depth, 1.2 m/s for entry
Ship @ bottom contact	12:17	36°23.10'N	25°22.08'E	boko @ 284m wire out, max. payout 289m, 12kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery:060cm Bottom Temperature: 25°C Pore fluid sampling @ 013cm, 045cm (6.20 pH, -32 Eh), (@005cm: 6.88 pH, -61 Eh, @ 033cm: 6.18 pH, -5 Eh, no pore fluid sampling) Sediment sampling @ 006cm, 013cm, 045cm, pieces of blackish crust from outside of corer

Station: **POS510-101GC** **Date:** **2017-03-25**

Target Latitude: **36°22.11'N** **Target Longitude:** **25°22.09'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:38	36°23.14'N	25°22.04'E	232m water depth, 1.2 m/s for entry
Ship @ bottom contact	12:44	36°23.14'N	25°22.06'E	boko @ 265m wire out, max. payout 271m, 12kN on pulling
Ship @ station end				

Remarks on recovery and material	No sample

Station: **POS510-102GC** **Date:** **2017-03-25**

Target Latitude: **36°22.11'N** **Target Longitude:** **25°22.09'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	13:57	36°23.14'N	25°22.05'E	233m water depth, 1.4 m/s for entry
Ship @ bottom contact	14:02	36°23.14'N	25°22.05'E	boko @ 257m wire out, max. payout 264m, 12kN on pulling
Ship @ station end				

Remarks on recovery and material	No sample

Station: **POS510-106GC** **Date:** **2017-03-27**

Target Latitude: **36°27.00'N** **Target Longitude:** **25°24.75'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	06:00	36°27.00'N	25°24.76'E	205m water depth, 1.0 m/s for entry
Ship @ bottom contact	06:04	36°27.00'N	25°24.76'E	boko @ 206m wire out, max. payout 211m, 11kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery:100cm Pore fluid sampling @ 010cm (6.78 pH, -20 Eh), 040cm (6.37 pH, -3 Eh), 070cm (6.49 pH, 42 Eh) Sediment sampling @ 010cm, 034cm (crust), 040cm, 070cm, core catcher

Station: **POS510-107GC** **Date:** **2017-03-27**

Target Latitude: **36°26.75'N** **Target Longitude:** **25°24.70'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	06:23	36°26.75'N	25°24.69'E	293m water depth, 1.0 m/s for entry
Ship @ bottom contact	06:28	36°26.75'N	25°24.69'E	boko @ 298m wire out, max. payout 303m, 12kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: ca. 013cm Few cm large pumice clasts and reddish brown mud. No geochemical or pore fluid sampling.

Station: **POS510-108GC** **Date:** **2017-03-27**

Target Latitude: **36°26.75'N** **Target Longitude:** **25°24.45'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	1. 06:49 2. 07:03	36°26.76'N 36°26.75'N	25°24.43'E 25°24.45'E	1. 326m water depth, 1.0 m/s for entry 2. 326m water depth, 1.2 m/s for entry
Ship @ bottom contact	1. 06:54 2. 07:08	36°26.76'N 36°26.75'N	25°24.45'E 25°24.45'E	1. boko @ 342m wire out, max. payout 347m, 13kN on pulling 2. boko @ 344m wire out, max. payout 349m, 14kN on pulling
Ship @ station end				

Remarks on recovery and material	1. no sample 2. Recovery: 003cm No geochemical or pore fluid sampling.

Station: **POS510-109GC** **Date:** **2017-03-27**

Target Latitude: **36°26.40'N** **Target Longitude:** **25°23.66'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	07:33	36°26.40'N	25°23.66'E	376m water depth, 1.0 m/s for entry
Ship @ bottom contact	07:40	36°26.40'N	25°23.68'E	boko @ 389m wire out, max. payout 394m, 13kN on pulling
Ship @ station end				
Remarks on recovery and material	no sample			

Station: **POS510-110GC** **Date:** **2017-03-27**

Target Latitude: **36°26.69'N** **Target Longitude:** **25°23.20'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	08:07	36°26.68'N	25°23.19'E	375m water depth, 1.0 m/s for entry
Ship @ bottom contact	08:13	36°26.70'N	25°23.21'E	boko @ 390m wire out, max. payout 395m, 13kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 040cm Pore fluid sampling @ 002cm (7.60 pH, 209 Eh), 020cm (@025cm: 7.74 pH, 48 Eh) Sediment sampling @ 001cm, 020cm, core catcher

Station: **POS510-111GC** **Date:** **2017-03-27**

Target Latitude: **36°15.59'N** **Target Longitude:** **25°18.70'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	10:17	36°15.58'N	25°18.72'E	385m water depth, stop @ 340m, 1.0 m/s for entry
Ship @ bottom contact	10:27	36°15.59'N	25°18.69'E	boko @ 406m wire out, max. payout 411m, 20kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 060cm Pore fluid sampling @ 020cm (7.74 pH, 216 Eh), 045cm, 056cm (@059cm: 8.03 pH, 166 Eh) (@005cm: 7.59 pH, 248 Eh, no sampling) Sediment sampling @ 004-006cm (from AH), 020cm, 045cm, 056cm, core catcher

Station: **POS510-112GC** **Date:** **2017-03-27**

Target Latitude: **36°15.30’N** **Target Longitude:** **25°19.00’E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	11:15	36°15.30’N	25°18.97’E	343m water depth, stop @ 300m, 1.0 m/s for entry
Ship @ bottom contact	11:24	36°15.31’N	25°18.98’E	boko @ 355m wire out, max. payout 361m, 15kN on pulling
Ship @ station end				

Remarks on recovery and material	Recovery: 035cm Pore fluid sampling @ 010cm (7.66 pH, 168 Eh), 033cm (7.75 pH, 204 Eh) Sediment sampling @ 010cm, 033cm, core catcher

Station: **POS510-113GC** **Date:** **2017-03-27**

Target Latitude: **36°14.42'N** **Target Longitude:** **25°17.20'E**

	Time (UTC)	Latitude	Longitude	Comment
Ship @ station begin	12:27	36°14.40'N	25°17.21'E	439m water depth, stop @ 400m, 1.0 m/s for entry
Ship @ bottom contact	12:38	36°14.43'N	25°17.19'E	boko @ 456m wire out, max. payout 461m, 19kN on pulling
Ship @ station end				
Remarks on recovery and material	Recovery: 150cm Heterogeneous , poorly sorted sandy sediment with minor clay component and shell remnants. Pore fluid sampling @ 013cm (7.71 pH, 167 Eh), 039cm (7.72 pH, 204 Eh), 053cm (7.94 pH, 167 Eh), 080cm (8.19 pH, 185 Eh), 100cm (8.00 pH, 104 Eh), 140cm (7.92 pH, 88 Eh) Sediment sampling @ 015cm, 040cm, 055cm, 080c, 100cm, 140cm			

Station: POS510-03GC **Date: 2017-03-10**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C	-	-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section A	96°C						
Core Catcher							

Station: <u>POS510-04GC</u> Date: <u>2017-03-10</u>

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C	-	-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section A	27-28°C						
Core Catcher							

Station: **POS510-05GC** **Date:** **2017-03-10**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C	-	-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B	15°C		7.26		-149		
Section A	15°C		7.13		-144		
Core Catcher							

Station: POS510-06GC **Date: 2017-03-10**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C	-	-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section A	16°C						
Core Catcher							

Station: POS510-07GC Station according to Poseidon: POS510-06 Date: 2017-03-10

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C	-	-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section A	16°C						
Core Catcher							

Station: POS510-08GC **Station according to Poseidon: POS510-07** **Date: 2017-03-10**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C	-	-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15°C		7.09		-129		
Core Catcher							

Station: POS510-09GC Station according to Poseidon: POS510-08 Date: 2017-03-10

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C	18°C	-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B	57°C						
Section A	87°C						
Core Catcher							

Station: POS510-13GC Station according Poseidon: POS510-12 POS510-Date: 2017-03-12

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	16		7,1		-98		
Core Catcher	16						

Station: **POS510-14GC** **Station according to Poseidon:** **POS510-13** **Date:** **2017-03-12**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	16		6,71		59		
Core Catcher	15						

Station: POS510-15GC **Station according to Poseidon: POS510-13** **Date: 2017-03-12**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	19						
Core Catcher	18						

Station: **POS510-16GC** **Station according to Poseidon:** **POS510-14** **Date:** **2017-03-12**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15						
Core Catcher							

Station: POS510-17GC Station according to Poseidon: POS510-15 Date: 2017-03-12

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15 – 16		7,49		-73		
Core Catcher							

Station: POS510-16GC-B **Station according to Poseidon: POS510-16** **Date: 2017-03-12**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	17		6,46		-1		
Core Catcher							

Station: POS510-17GC-B **Station according to Poseidon: POS510-17** **Date: 2017-03-12**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	17						
Core Catcher							

Station: POS510-18GC Date: 2017-03-12

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B	20						
Section A	21						
Core Catcher							

Station: **POS510-19GC** **Date:** **2017-03-12**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	16						
Core Catcher							

Station: POS510-20GC Date: 2017-03-12

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C	18,5	-	5,88	-	58	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B	20		5,83		59		
Section A	20						
Core Catcher							

Station: POS510-26GC Date: 2017-03-14

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15 - 16	In greyish sediment	7,72		165		
Core Catcher	15						

Station: <u>POS510-27GC</u> Date: <u>2017-03-14</u>

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher	15		7,82		133		

<u>Only core catcher sample</u>

Station: <u>POS510-28GC</u> **Date: <u>2017-03-14</u>**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

<u>No sample</u>

Station: <u>POS510-29GC</u> Date: <u>2017-03-14</u>

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

<u>No sample</u>

Station: **POS510-36GC** **Date:** **2017-03-17**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

No sample!

Station: POS510-37GC **Date: 2017-03-17**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

No sample!

Station: POS510-38GC Date: 2017-03-17

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom	7.74 / 7.8	Bottom	199 / 176	
Section B	14						
Section A							
Core Catcher	14						

Station: POS510-39GC Date: 2017-03-17

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

No sample!

Station: POS510-40GC **Date: 2017-03-17**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	17		7.88		170		
Core Catcher							

Station: POS510-41GC Date: 2017-03-17

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.8		180		
Core Catcher							

Station: POS510-42GC **Date: 2017-03-17**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15						
Core Catcher	15						

Station: POS510-43GC Date: 2017-03-17

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C	16	-	7.66	-	-115	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B	16.2		7.73		27		
Section A	14						
Core Catcher	15		8.15		106		

Station: POS510-44GC **Date: 2017-03-17**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.68		138		
Core Catcher							

Station: POS510-45GC **Date: 2017-03-17**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.70		74		
Core Catcher							

Station: POS510-47GC Date: 2017-03-18

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

No sample

Station: **POS510-48GC** **Date:** **2017-03-18**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A		15	7.72		152		
Core Catcher	15		7.92		-57		

Station: POS510-49GC Date: 2017-03-18

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.83 / 8.14	7.74	-121 / -29	163	
Core Catcher	15		7.96		111		

Station: **POS510-50GC** **Date:** **2017-03-18**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.71		167		
Core Catcher	14		8.10 / 8.18		100		

Station: POS510-51GC Date: 2017-03-18

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15 - 16		7.64		183		
Core Catcher							

Station: POS510-52GC Date: 2017-03-18

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.69		211		
Core Catcher	15		7.97		133		

Station: POS510-54GC Date: 2017-03-19

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

No sample!

Station: POS510-55GC Date: 2017-03-19

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.82		64		
Core Catcher							

Station: POS510-56GC Date: 2017-03-19

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-	-	-	-	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B	15						
Section A	15						
Core Catcher							

Station: POS510-59GC Date: 2017-03-20

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C	13	-	7.64	-	-45	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B	14		7.65		-63		
Section A	15						
Core Catcher							

Station: POS510-60GC **Date: 2017-03-20**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	16						
Core Catcher							

Station: POS510-61GC   Date: 2017-03-20

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.85		131		
Core Catcher							

Station: POS510-62GC Date: 2017-03-20

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	16		7.77		143		
Core Catcher	18		8.11		100		

Station: POS510-63GC **Date: 2017-03-20**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B	16		7.84		114		
Section A	15						
Core Catcher			7.57		115		

Station: POS510-64GC Date: 2017-03-20

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A			7.67		144		
Core Catcher							

Station: POS510-65GC **Date: 2017-03-20**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.70		92		
Core Catcher	15		7.69		85		

Station: POS510-66GC Date: 2017-03-20

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher	16		7.67		-36		

Station: POS510-67GC Date: 2017-03-20

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.75		-96		
Core Catcher							

Station: **POS510-68GC** **Date:** **2017-03-20**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

Only little sample (~8cm). No deck measurements.

Station: POS510-69GC Date: 2017-03-20

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		6.99		22		
Core Catcher	15		7.02		-11		

Station: POS510-70GC   Date: 2017-03-20

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B	41		5.63		-12		
Section A	54						
Core Catcher	52		6.17		-58		

Station: POS510-73-2GC Date: 2017-03-21

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	14		7.49		119		
Core Catcher	15		7.97		69		

Station: POS510-74GC Date: 2017-03-21

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.76		114		
Core Catcher							

Station: <u>POS510-76GC</u> Date: <u>2017-03-22</u>

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

<u>No sample</u>

Station: <u>POS510-77GC</u> Date: <u>2017-03-22</u>

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

<u>No sample</u>

Station: POS510-78GC **Date: 2017-03-22**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B	15		7.61		202		
Section A	15						
Core Catcher	15		7.97		158		

Station: POS510-79-1GC Date: 2017-03-22

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.64 (brown) 7.69 (grey)		78 (brown) -64 (grey)		
Core Catcher							

Station: POS510-79-2GC Date: 2017-03-22

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.51		Error		
Core Catcher			7.43		-68		

Station: POS510-80GC Date: 2017-03-22

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.57		185		
Core Catcher	15		7.85		135		

Station: POS510-87GC **Date: 2017-03-24**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B	16		7.32		-188		
Section A	16		7.39		-149		
Core Catcher							

Station: **POS510-88-1GC** **Date:** **2017-03-24**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

No deck measurements

Station: <u>POS510-88-2GC</u> Date: <u>2017-03-24</u>

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	16			7.17		-74	
Core Catcher							

Station: **<u>POS510-89-1GC</u>** **Date:** **<u>2017-03-24</u>**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

<u>No deck measurements</u>

Station: POS510-89-2GC Date: 2017-03-24

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15-16		7.23		-155		
Core Catcher							

Station: POS510-90-1GC **Date: 2017-03-24**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

No sample

Station: POS510-90-2GC Date: 2017-03-24

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	16		7.28		-179		
Core Catcher							

Station: POS510-90-3GC   Date: 2017-03-24

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.35		-191		
Core Catcher							

Station: POS510-91GC Date: 2017-03-24

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C	17	-	7.27	-	-161	-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B	18		7.30		-162		
Section A	17						
Core Catcher							

Station: POS510-92GC Date: 2017-03-24

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B	58	20					
Section A	99						
Core Catcher	76						

Station: <u>POS510-93GC</u> Date: <u>2017-03-24</u>

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	19		7.26		-185		
Core Catcher							

Station: POS510-95GC **Date: 2017-03-25**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	16		7.82		-121		
Core Catcher							

Station: POS510-96-1GC **Date: 2017-03-25**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	16	15		7.15		30	
Core Catcher							

Station: **POS510-96-2GC** **Date:** **2017-03-25**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	20	15	6.64	6.21	226	158	
Core Catcher							

Station: POS510-97GC Date: 2017-03-25

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	17		7.71		-185		
Core Catcher							

Station: POS510-98GC **Date: 2017-03-25**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.81		-103		
Core Catcher							

Station: POS510-99GC Date: 2017-03-25

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	16		7.63		-161		
Core Catcher							

Station: POS510-100GC **Date: 2017-03-25**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	25		6.17		-1		
Core Catcher							

Station: POS510-101GC **Date: 2017-03-25**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

No sample

Station: **<u>POS510-102GC</u>** **Date:** **<u>2017-03-25</u>**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

<u>No sample</u>

Station: POS510-106GC Date: 2017-03-27

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	18		6.39		-1		
Core Catcher							

Station: POS510-107GC Date: 2017-03-27

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	18						
Core Catcher							

Station: POS510-108GC Date: 2017-03-27

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

No sample

Station: POS510-109GC Date: 2017-03-27

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A							
Core Catcher							

1. No sample

2. No deck measurements

Station: POS510-110GC **Date: 2017-03-27**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	17		7.67		-158		
Core Catcher							

Station: POS510-111GC Date: 2017-03-27

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	15		7.75		Error measurement		
Core Catcher							

Station: **POS510-112GC** **Date:** **2017-03-27**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B							
Section A	16		7.55		231		
Core Catcher							

Station: POS510-113GC **Date: 2017-03-27**

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom	Top	Bottom	Top	Bottom	Top	
Section C		-		-		-	-

	Temperature (°C)		pH		Eh (mV)		Comment
	Bottom		Bottom		Bottom		
Section B	15						
Section A	15		7.67		Error measurement		
Core Catcher							

GEOMAR
Helmholtz-Zentrum für Ozeanforschung Kiel

GEOMAR Reports

No.	Title
1	FS POSEIDON Fahrtbericht / Cruise Report POS421, 08. – 18.11.2011, Kiel - Las Palmas, Ed.: T.J. Müller, 26 pp, DOI: 10.3289/GEOMAR_REP_NS_1_2012
2	Nitrous Oxide Time Series Measurements off Peru – A Collaboration between SFB 754 and IMARPE –, Annual Report 2011, Eds.: Baustian, T., M. Graco, H.W. Bange, G. Flores, J. Ledesma, M. Sarmiento, V. Leon, C. Robles, O. Moron, 20 pp, DOI: 10.3289/GEOMAR_REP_NS_2_2012
3	FS POSEIDON Fahrtbericht / Cruise Report POS427 – Fluid emissions from mud volcanoes, cold seeps and fluid circulation at the Don-_Kuban deep sea fan (Kerch peninsula, Crimea, Black Sea) – 23.02. – 19.03.2012, Burgas, Bulgaria - Heraklion, Greece, Ed.: J. Bialas, 32 pp, DOI: 10.3289/GEOMAR_REP_NS_3_2012
4	RV CELTIC EXPLORER EUROFLEETS Cruise Report, CE12010 – ECO2@NorthSea, 20.07. – 06.08.2012, Bremerhaven – Hamburg, Eds.: P. Linke et al., 65 pp, DOI: 10.3289/GEOMAR_REP_NS_4_2012
5	RV PELAGIA Fahrtbericht / Cruise Report 64PE350/64PE351 – JEDDAH-TRANSECT -, 08.03. – 05.04.2012, Jeddah – Jeddah, 06.04 - 22.04.2012, Jeddah – Duba, Eds.: M. Schmidt, R. Al-Farawati, A. Al-Aidaroos, B. Kürten and the shipboard scientific party, 154 pp, DOI: 10.3289/GEOMAR_REP_NS_5_2013
6	RV SONNE Fahrtbericht / Cruise Report SO225 - MANIHIKI II Leg 2 The Manihiki Plateau - Origin, Structure and Effects of Oceanic Plateaus and Pleistocene Dynamic of the West Pacific Warm Water Pool, 19.11.2012 - 06.01.2013 Suva / Fiji – Auckland / New Zealand, Eds.: R. Werner, D. Nürnberg, and F. Hauff and the shipboard scientific party, 176 pp, DOI: 10.3289/GEOMAR_REP_NS_6_2013
7	RV SONNE Fahrtbericht / Cruise Report SO226 – CHRIMP CHatham RIse Methane Pockmarks, 07.01. - 06.02.2013 / Auckland – Lyttleton & 07.02. – 01.03.2013 / Lyttleton – Wellington, Eds.: Jörg Bialas / Ingo Klaucke / Jasmin Mögeltönder, 126 pp, DOI: 10.3289/GEOMAR_REP_NS_7_2013
8	The SUGAR Toolbox - A library of numerical algorithms and data for modelling of gas hydrate systems and marine environments, Eds.: Elke Kossel, Nikolaus Bigalke, Elena Piñero, Matthias Haeckel, 168 pp, DOI: 10.3289/GEOMAR_REP_NS_8_2013
9	RV ALKOR Fahrtbericht / Cruise Report AL412, 22.03.-08.04.2013, Kiel – Kiel. Eds: Peter Linke and the shipboard scientific party, 38 pp, DOI: 10.3289/GEOMAR_REP_NS_9_2013
10	Literaturrecherche, Aus- und Bewertung der Datenbasis zur Meerforelle (Salmo trutta trutta L.) Grundlage für ein Projekt zur Optimierung des Meerforellenmanagements in Schleswig-Holstein. Eds.: Christoph Petereit, Thorsten Reusch, Jan Dierking, Albrecht Hahn, 158 pp, DOI: 10.3289/GEOMAR_REP_NS_10_2013
11	RV SONNE Fahrtbericht / Cruise Report SO227 TAIFLUX, 02.04. – 02.05.2013, Kaohsiung – Kaohsiung (Taiwan), Christian Berndt, 105 pp, DOI: 10.3289/GEOMAR_REP_NS_11_2013
12	RV SONNE Fahrtbericht / Cruise Report SO218 SHIVA (Stratospheric Ozone: Halogens in a Varying Atmosphere), 15.-29.11.2011, Singapore - Manila, Philippines, Part 1: SO218- SHIVA Summary Report (in German), Part 2: SO218- SHIVA English reports of participating groups, Eds.: Birgit Quack & Kirstin Krüger, 119 pp, DOI: 10.3289/GEOMAR_REP_NS_12_2013
13	KIEL276 Time Series Data from Moored Current Meters. Madeira Abyssal Plain, 33°N, 22°W, 5285 m water depth, March 1980 – April 2011. Background Information and Data Compilation. Eds.: Thomas J. Müller and Joanna J. Waniek, 239 pp, DOI: 10.3289/GEOMAR_REP_NS_13_2013

GEOMAR
Helmholtz-Zentrum für Ozeanforschung Kiel

GEOMAR Reports

No.	Title
14	RV POSEIDON Fahrtbericht / Cruise Report POS457: ICELAND HAZARDS Volcanic Risks from Iceland and Climate Change:The Late Quaternary to Anthropogene Development Reykjavík / Iceland – Galway / Ireland, 7.-22. August 2013. Eds.: Reinhard Werner, Dirk Nürnberg and the shipboard scientific party, 88 pp, DOI: 10.3289/GEOMAR_REP_NS_14_2014
15	RV MARIA S. MERIAN Fahrtbericht / Cruise Report MSM-34 / 1 & 2, SUGAR Site, Varna – Varna, 06.12.13 – 16.01.14. Eds: Jörg Bialas, Ingo Klaucke, Matthias Haeckel, 111 pp, DOI: 10.3289/GEOMAR_REP_NS_15_2014
16	RV POSEIDON Fahrtbericht / Cruise Report POS 442, "AUVinTYS" High-resolution geological investigations of hydrothermal sites in the Tyrrhenian Sea using the AUV "Abyss", 31.10. – 09.11.12, Messina – Messina, Ed.: Sven Petersen, 32 pp, DOI: 10.3289/GEOMAR_REP_NS_16_2014
17	RV SONNE, Fahrtbericht / Cruise Report, SO 234/1, "SPACES": Science or the Assessment of Complex Earth System Processes, 22.06. – 06.07.2014, Walvis Bay / Namibia - Durban / South Africa, Eds.: Reinhard Werner and Hans-Joachim Wagner and the shipbord scientific party, 44 pp, DOI: 10.3289/GEOMAR_REP_NS_17_2014
18	RV POSEIDON Fahrtbericht / Cruise Report POS 453 & 458, "COMM3D", Crustal Structure and Ocean Mixing observed with 3D Seismic Measurements, 20.05. – 12.06.2013 (POS453), Galway, Ireland – Vigo, Portugal, 24.09. – 17.10.2013 (POS458), Vigo, Portugal – Vigo, Portugal, Eds.: Cord Papenberg and Dirk Klaeschen, 66 pp, DOI: 10.3289/GEOMAR_REP_NS_18_2014
19	RV POSEIDON, Fahrtbericht / Cruise Report, POS469, "PANAREA", 02. – 22.05.2014, (Bari, Italy – Malaga, Spain) & Panarea shallow-water diving campaign, 10. – 19.05.2014, Ed.: Peter Linke, 55 pp, DOI: 10.3289/GEOMAR_REP_NS_19_2014
20	RV SONNE Fahrtbericht / Cruise Report SO234-2, 08.-20.07.2014, Durban, -South Africa - Port Louis, Mauritius, Eds.: Kirstin Krüger, Birgit Quack and Christa Marandino, 95 pp, DOI: 10.3289/GEOMAR_REP_NS_20_2014
21	RV SONNE Fahrtbericht / Cruise Report SO235, 23.07.-07.08.2014, Port Louis, Mauritius to Malé, Maldives, Eds.: Kirstin Krüger, Birgit Quack and Christa Marandino, 76 pp, DOI: 10.3289/GEOMAR_REP_NS_21_2014
22	RV SONNE Fahrtbericht / Cruise Report SO233 WALVIS II, 14.05-21.06.2014, Cape Town, South Africa - Walvis Bay, Namibia, Eds.: Kaj Hoernle, Reinhard Werner, and Carsten Lüter, 153 pp, DOI: 10.3289/GEOMAR_REP_NS_22_2014
23	RV SONNE Fahrtbericht / Cruise Report SO237 Vema-TRANSIT Bathymetry of the Vema-Fracture Zone and Puerto Rico TRench and Abyssal AtlaNtic BiodiverSITy Study, Las Palmas (Spain) - Santo Domingo (Dom. Rep.) 14.12.14 - 26.01.15, Ed.: Colin W. Devey, 130 pp, DOI: 10.3289/GEOMAR_REP_NS_23_2015
24	RV POSEIDON Fahrtbericht / Cruise Report POS430, POS440, POS460 & POS467 Seismic Hazards to the Southwest of Portugal; POS430 - La-Seyne-sur-Mer - Portimao (7.4. - 14.4.2012), POS440 - Lisbon - Faro (12.10. - 19.10.2012), POS460 - Funchal - Portimao (5.10. - 14.10.2013), POS467 - Funchal - Portimao (21.3. - 27.3.2014), Ed.: Ingo Grevemeyer, 43 pp, DOI: 10.3289/GEOMAR_REP_NS_24_2015
25	RV SONNE Fahrtbericht / Cruise Report SO239, EcoResponse Assessing the Ecology, Connectivity and Resilience of Polymetallic Nodule Field Systems, Balboa (Panama) – Manzanillo (Mexico), 11.03. -30.04.2015, Eds.: Pedro Martínez Arbizu and Matthias Haeckel, 204 pp, DOI: 10.3289/GEOMAR_REP_NS_25_2015

GEOMAR
Helmholtz-Zentrum für Ozeanforschung Kiel

GEOMAR Reports

No.	Title
26	RV SONNE Fahrtbericht / Cruise Report SO242-1, JPI OCEANS Ecological Aspects of Deep-Sea Mining, DISCOL Revisited, Guayaquil - Guayaquil (Equador), 29.07.-25.08.2015, Ed.: Jens Greinert, 290 pp, DOI: 10.3289/GEOMAR_REP_NS_26_2015
27	RV SONNE Fahrtbericht / Cruise Report SO242-2, JPI OCEANS Ecological Aspects of Deep-Sea Mining DISCOL Revisited, Guayaquil - Guayaquil (Equador), 28.08.-01.10.2015, Ed.: Antje Boetius, 552 pp, DOI: 10.3289/GEOMAR_REP_NS_27_2015
28	RV POSEIDON Fahrtbericht / Cruise Report POS493, AUV DEDAVE Test Cruise, Las Palmas - Las Palmas (Spain), 26.01.-01.02.2016, Ed.: Klas Lackschewitz, 17 pp, DOI: 10.3289/GEOMAR_REP_NS_28_2016
29	Integrated German Indian Ocean Study (IGIOS) - From the seafloor to the atmosphere - A possible German contribution to the International Indian Ocean Expedition 2 (IIOE-2) programme – A Science Prospectus, Eds.: Bange, H.W. , E.P. Achterberg, W. Bach, C. Beier, C. Berndt, A. Biastoch, G. Bohrmann, R. Czeschel, M. Dengler, B. Gaye, K. Haase, H. Herrmann, J. Lelieveld, M. Mohtadi, T. Rixen, R. Schneider, U. Schwarz-Schampera, J. Segschneider, M. Visbeck, M. Voß, and J. Williams, 77pp, DOI: 10.3289/GEOMAR_REP_NS_29_2016
30	RV SONNE Fahrtbericht / Cruise Report SO249, BERING – Origin and Evolution of the Bering Sea: An Integrated Geochronological, Volcanological, Petrological and Geochemical Approach, Leg 1: Dutch Harbor (U.S.A.) - Petropavlovsk-Kamchatsky (Russia), 05.06.2016-15.07.2016, Leg 2: Petropavlovsk-Kamchatsky (Russia) - Tomakomai (Japan), 16.07.2016-14.08.2016, Eds.: Reinhard Werner, et al., DOI: 10.3289/GEOMAR_REP_NS_30_2016
31	RV POSEIDON Fahrtbericht/ Cruise Report POS494/2, HIERROSEIS Leg 2: Assessment of the Ongoing Magmatic-Hydrothermal Discharge of the El Hierro Submarine Volcano, Canary Islands by the Submersible JAGO, Valverde – Las Palmas (Spain), 07.02.-15.02.2016, Eds.: Hannington, M.D. and Shipboard Scientific Party, DOI: 10.3289/GEOMAR_REP_NS_31_2016
32	RV METEOR Fahrtbericht/ Cruise Report M127, Extended Version, Metal fluxes and Resource Potential at the Slow-spreading TAG Midocean Ridge Segment (26°N, MAR) – Blue Mining@Sea, Bridgetown (Barbados) – Ponta Delgada (Portugal) 25.05.-28.06.2016, Eds.: Petersen, S. and Shipboard Scientific Party, DOI: 10.3289/GEOMAR_REP_NS_32_2016
33	RV SONNE Fahrtbericht/Cruise Report SO244/1, GeoSEA: Geodetic Earthquake Observatory on the Seafloor, Antofagasta (Chile) – Antofagasta (Chile), 31.10.-24.11.2015, Eds.: Jan Behrmann, Ingo Klaucke, Michal Stipp, Jacob Geersen and Scientific Crew SO244/1, DOI: 10.3289/GEOMAR_REP_NS_33_2016
34	RV SONNE Fahrtbericht/Cruise Report SO244/2, GeoSEA: Geodetic Earthquake Observatory on the Seafloor, Antofagasta (Chile) – Antofagasta (Chile), 27.11.-13.12.2015, Eds.: Heidrun Kopp, Dietrich Lange, Katrin Hannemann, Anne Krabbenhoeft, Florian Petersen, Anina Timmermann and Scientific Crew SO244/2, DOI: 10.3289/GEOMAR_REP_NS_34_2016
35	RV SONNE Fahrtbericht/Cruise Report SO255, VITIAZ – The Life Cycle of the Vitiaz-Kermadec Arc / Backarc System: from Arc Initiation to Splitting and Backarc Basin Formation, Auckland (New Zealand) - Auckland (New Zealand), 02.03.-14.04.2017, Eds.: Kaj Hoernle, Folkmar Hauff, and Reinhard Werner with contributions from cruise participants, DOI: 10.3289/GEOMAR_REP_NS_35_2017

GEOMAR
Helmholtz-Zentrum für Ozeanforschung Kiel

GEOMAR Reports

No.	Title
36	RV POSEIDON Fahrtbericht/Cruise Report POS515, CALVADOS - CALabrian arc mud VolcAnoes: Deep Origin and internal Structure, Dubrovnik (Croatia) – Catania (Italy), 18.06.-13.07.2017, Eds.: M. Riedel, J. Bialas, A. Krabbenhoeft, V. Bähre, F. Beeck, O. Candoni, M. Kühn, S. Muff, J. Rindfleisch, N. Stange, DOI: 10.3289/GEOMAR_REP_NS_36_2017
37	RV MARIA S. MERIAN Fahrtbericht/Cruise Report MSM63, PERMO, Southampton – Southampton (U.K.), 29.04.-25.05.2017, Eds.: Christian Berndt and Judith Elger with contributions from cruise participants C. Böttner, R.Gehrmann, J. Karstens, S. Muff, B. Pitcairn, B. Schramm, A. Lichtschlag, A.-M. Völsch, DOI: 10.3289/GEOMAR_REP_NS_37_2017
38	RV SONNE Fahrtbericht/Cruise Report SO258/1, INGON: The Indian - Antarctic Break-up Engima, Fremantle (Australia) - Colombo (Sri Lanka), 07.06.-09.07.2017, 29.04.-25.05.2017, Eds.: Reinhard Werner, Hans-Joachim Wagner, and Folkmar Hauff with contributions from cruise participants, DOI: 10.3289/GEOMAR_REP_NS_38_2017
39	RV POSEIDON Fahrtbericht/Cruise Report POS509, ElectroPal 2: Geophysical investigations of sediment hosted massive sulfide deposits on the Palinuro Volcanic Complex in the Tyrrhenian Sea, Malaga (Spain) – Catania (Italy), 15.02.-03.03.2017, Ed.: Sebastian Hölz, DOI: 10.3289/GEOMAR_REP_NS_39_2017
40	RV POSEIDON Fahrtbericht/Cruise Report POS518, Baseline Study for the Environmental Monitoring of Subseafloor CO_2 Storage Operations, Leg 1: Bremerhaven – Bremerhaven (Germany), 25.09.-11.10.2017, Leg 2: Bremerhaven – Kiel (Germany), 12.10.-28.10.2017, Eds.: Peter Linke and Matthias Haeckel, DOI: 10.3289/GEOMAR_REP_NS_40_2018
41	RV MARIA S. MERIAN Fahrtbericht/Cruise Report MSM71, LOBSTER: Ligurian Ocean Bottom Seismology and Tectonics Research, Las Palmas (Spain) – Heraklion (Greece), 07.02.-27.02.2018, Eds.: H. Kopp, D. Lange, M. Thorwart, A. Paul, A. Dannowski, F. Petersen, C. Aubert, F. Beek, A. Beniest, S. Besançon, A. Brotzer, G. Caielli, W. Crawford, M. Deen, C. Lehmann, K. Marquardt, M. Neckel, L. Papanagnou, B. Schramm, P. Schröder, K.-P. Steffen, F. Wolf, Y. Xia, DOI: 10.3289/GEOMAR_REP_NS_41_2018
42	RV METEOR Fahrtbericht/Cruise Report M143, SLOGARO: Slope failures and active gas expulsion along the Romanian margin – investigating relations to gas hydrate distribution, Varna (Romania) – Heraklion (Greece), 12.12.-22.12.2017, Eds.: M. Riedel, F. Gausepohl, I. Gazis, L. Hähnel, M. Kampmeier, P. Urban, J. Bialas, DOI: 10.3289/GEOMAR_REP_NS_42_2018
43	RV POSEIDON Fahrtbericht/Cruise Report POS510, ANYDROS: Rifting and Hydrothermal Activity in the Cyclades Back-arc Basin, Catania (Italy) – Heraklion (Greece), 06.03.-29.03.2017, Ed.: M.D. Hannington, DOI: 10.3289/GEOMAR_REP_NS_43_2018

For GEOMAR Reports, please visit:
https://oceanrep.geomar.de/view/series/GEOMAR_Report.html

Reports of the former IFM-GEOMAR series can be found under:
https://oceanrep.geomar.de/view/series/IFM-GEOMAR_Report.html

Das GEOMAR Helmholtz-Zentrum für Ozeanforschung Kiel
ist Mitglied der Helmholtz-Gemeinschaft
Deutscher Forschungszentren e.V.

The GEOMAR Helmholtz Centre for Ocean Research Kiel
is a member of the Helmholtz Association of
German Research Centres

Helmholtz-Zentrum für Ozeanforschung Kiel / Helmholtz Centre for Ocean Research Kiel
GEOMAR
Dienstgebäude Westufer / West Shore Building
Düsternbrooker Weg 20
D-24105 Kiel
Germany

Helmholtz-Zentrum für Ozeanforschung Kiel / Helmholtz Centre for Ocean Research Kiel
GEOMAR
Dienstgebäude Ostufer / East Shore Building
Wischhofstr. 1-3
D-24148 Kiel
Germany

Tel.: +49 431 600-0
Fax: +49 431 600-2805
www.geomar.de